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TREATMENT OF HYPERTENSION *

NELLIS B. FOSTER, M.D.

NEW YORK

It is customary to speak of hypertension as an entity, in the same way that we might speak of fever. This is due to the fact that the clinical estimations of blood pressure in the beginning were applicable only to the systolic phase and not until more recently, after the auscultatory method had been discovered, were we able to make estimation of the diastolic pressure as well. At present it is not correct to speak of an elevation of blood pressure without designating both systolic and diastolic phases. When we study blood pressure curves by determinations that have been carried out under control conditions, we find peculiarities in the systolic and diastolic phases which make it impossible to explain the departures from normal in so simple a way as is usually done. For example, we notice elevations in both systolic and diastolic phases, and this is the most common type of hypertension which comes under clinical observation (Chart 2). We find also cases in which the systolic is considerably elevated above normal, but the diastolic is either normal or only slightly elevated (Chart 1). Occasionally there is also observed distinct, though slight, elevations in the diastolic pressure without corresponding elevation in the systolic pressure (Chart 3). From a physiologic point of view these different types of abnormal elevation in blood pressure must be explained by different factors in the circulation. The commonly cited theory, for example, that all elevations in blood pressure are due to peripheral resistance cannot explain an elevation of systolic pressure without elevation also of the diastolic pressure. In Chart 1 the rise is systolic. That is a high pulse pressure.

This indicates that there are two main factors in operation in producing abnormal elevations in blood pressure of all types. These factors are, first, increased peripheral resistance dependent on vasoconstriction induced primarily through the central nervous system. The second factor is increased heart output. An increased cardiac output will first of all increase the systolic blood pressure and only secondarily increase the diastolic, so that cases presenting the combination of high systolic and normal diastolic pressure, in other words, a high pulse pressure, fall into this group. When the systolic and diastolic are both elevated we have a combination of two factors, increased heart output and a narrowing of the peripheral field of circulation due to vasomotor influences, as in Chart 2. These physiologic considerations are sufficient to indicate the futility of attempting to treat all cases of hypertension as though of common origin.

HYPERTENSION IN NEPHRITIS

I desire to make a specific application to definite disease groups wherein some type of hypertension is a symptom. The most common disorder under this heading is, of course, nephritis. While we do not understand the immediate causation of hypertension in nephritis, some principles are fairly familiar, so that our methods of treatment are not wholly empiric. There are many reasons for believing that nephritis is associated with an intoxication, and one manifestation of this intoxication is the increase in blood pressure through the action of a toxin on the vasomotor centers. As a foundation for treatment, I wish to call attention to some facts suggesting a relationship between blood pressure in general and nutrition. The most important of these facts is that more than half of all cases of hypertension, so-called, occur in persons who are definitely overweight. It would be erroneous to draw the deduction so often made that obesity is invariably a result of overeating. While some cases of obesity are undoubtedly dependent on an unnecessarily large food consumption, other cases are just as distinctly a manifestation of a nutrition disorder. The second fact that is worthy of consideration is that low blood pressure occurs usually in the undernourished. It has been definitely demonstrated by Benedict [1] that undernutrition in healthy young persons has as one of its consequences a marked slowing of the pulse rate and a very low blood pressure. Pulse rates below 50 and blood pressures of 90 systolic and 60 diastolic are surprising in healthy young men. However debatable as a mode of life in health, these two facts give a useful hint for the management of hypertensive disease in general and of nephritis hypertension in particular.

Unfortunately, the majority of cases of nephritic hypertension come under observation when the disease is already well advanced. This, of course, is due to the fact that the disorder may be latent and without symptoms for an indefinite period. The most definite characteristic of nephritis associated with hypertension is the tendency to store in the tissues nitrogenous bodies which should be excreted in the urine. For some time we have been utilizing this fact in the treatment of nephritis in general. The effect of low protein diets in some cases of chronic nephritis becomes apparent in the blood pressure curve, as well as in the general symptoms of the disease. Chart 4 is from a case of chronic nephritis, and shows the effect of restricting

* Read before the Section on Pharmacology and Therapeutics at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Benedict, F. G.: Proc. Nat. Acad. Sc. 4: 149, 1918.

protein food to approximately 30 gm. a day. This change in diet was the only change in therapeusis made during this period. Previous to this period the patient had been kept at rest without any notable change in the blood pressure curve.

One source of failure in securing favorable results in cases of this type is due to the expectation of the

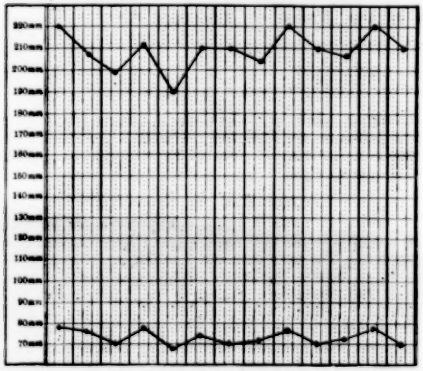


Chart 1.—Blood pressure of a patient admitted to the hospital on account of sciatica. Diagnosis, chronic nephritis, early; cardiac hypertrophy; arteriosclerosis; neuritis of sciatic nerve. Note high systolic pressure and normal diastolic phase.

physician that results will be shown in a relatively short time. This is not the case. A low protein diet may be maintained for a number of weeks without any detectable result in the blood pressure. But in many cases at least, if the method is persisted in for a couple of months, the blood pressure becomes definitely lower, along with an improvement in the general condition of the patient and an increase of his strength and his ability to withstand fatigue. Of course this is not invariably so. When the renal lesion is advanced and the lowest grade of protein metabolism taxes renal function, then little, if anything, can be accomplished in the reduction of the blood pressure any more than in the amelioration of other symptoms (Chart 2). But, on the whole, the method is always worth trying in my estimation, not primarily to relieve hypertension but to improve the condition of the patient, the hypertension being in a sense a guide, in a way that a temperature chart is a guide in infectious disease.

Occasionally one observes cases of hypertension associated with renal disease when the renal disease is not demonstrable. In some of these cases a sharp curtailment in the amount of salt taken with the food produces favorable results. These persons are likely to be large eaters and use abnormally large amounts of salt. One of the results of restriction of salt is that less food is taken, less protein food especially. A second consequence is that there is less thirst, and less fluid is drunk.

CASES IN WHICH HYPERTENSION IS ONLY SIGN

Next in frequency to the hypertension of renal disease is that ill-defined group of disorders wherein hypertension may be the only definite sign of abnormality. The majority are early cases of nephritis, a few are not. When these patients are seen early, the vascular hypertonus is confined to the systolic phase, the diastolic being relatively low or quite normal. This group includes the hypertension of the climacteric, certain anxiety neuroses and some cases of nontoxic goiter. In this group obesity is even more conspicuous than in the nephritic group. While a small percentage of these cases justify Vaquez' designation of "benign hypertension," since the hypertension may exist for years without the development of symptoms or vascular accident, nevertheless the majority of the patients finally do develop symptoms and signs of organic disease referable to heart, arteries or kidneys. The modes of death confirm this.

In a certain sense this is the most difficult type of hypertension to treat because, at the time when treatment is effective, the patient feels well and naturally objects to restrictions or an altered mode of life. Some of the patients of this class first discover the hypertensive disorder in the course of examinations for life insurance.

MANAGEMENT

The principle which is most likely to be useful in the management of this disorder is to regard vascular hypertonus in this group of cases as a symptom of an intoxication. The nature of the intoxication, frankly, we do not understand. It seems to affect primarily the vasomotor system and, so long as the elevation of blood pressure is confined to the systolic phase, the disorder cannot be regarded as seriously menacing health. But it cannot be forgotten that the disease ordinarily is progressive and that, in time, the diastolic blood pressure also becomes elevated. The diastolic phase measures the extra work imposed on the vascular system. From statistical evidence we know that these cases progress to cardiac disorders and vascular accidents. Having in mind the usual course of events, it is mandatory on us to do all that we are permitted to do to correct the disorder in its earliest stage—the only

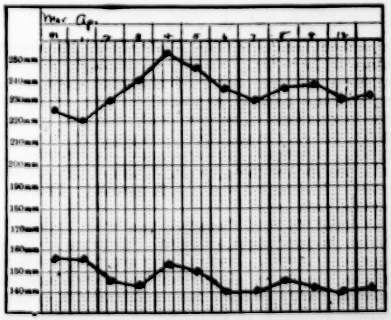


Chart 2.—Blood pressure of a patient admitted to the hospital on account of headaches, nausea and dyspnea. Diagnosis, advanced chronic nephritis; incipient uremia (urea nitrogen of blood much elevated; phenolsulphonephthalein below 10 per cent.; albuminuric retinitis); cardiac hypertrophy and dilatation; chronic passive congestion of lungs, liver and kidneys. Note systolic and diastolic phases both elevated; compare with Chart 1.

stage in which we can expect restitution to normal. Some of these cases occur in persons who are very active, who have abundance of energy, and who their life long have been accustomed to an unusual amount of responsibility. Just as likely we see cases among the

class who have been free of the ordinary responsibilities of life and have led a physically inactive and protected existence. As I have mentioned before, a large percentage of both classes is overweight.

In the management of these cases it is essential to know, not only the details of the physical state of the patient so far as it is possible to know them, but also to become acquainted with the temperament and the habits of the patient, especially in respect to work (both physical and mental), food and sleep. The primary object in regulating the treatment is to correct modes of life which are unwholesome. In the case of the person who has been accustomed to little or no exercise, it becomes necessary to increase the exercise gradually until he is able to do as much as a person of his age should do. His diet should be regulated according to his proper weight and not according to his real weight. That is to say, if a person weighs 200 pounds (91 kg.) and his proper weight for his height is 180 pounds (80 kg.), his diet should be on the basis of maintaining his weight at 180, which will, along with proper exercise, produce a gradual loss of weight to a suitable level.

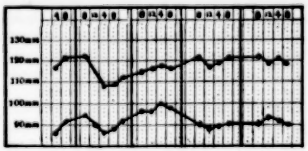


Chart 3.—Blood pressure of a woman, aged 38, under observation for five years on account of congenital cystic kidneys; only during the last year have there been detectable signs of defect in renal function; no failure of concentration as shown in specific gravity of urine, or nocturnal polyuria. Usual functional tests are negative. Blood nonprotein nitrogen becomes elevated on increased protein diet. Note constant abnormal elevation of diastolic pressure, the systolic phase remaining normal.

One other feature in respect to the diet in this class of case worthy of mention is that the protein intake should not be above the actual needs. Eight-tenths gram of protein per kilogram of body weight is ample for adults. The necessary fuel value of the diet can be made up by carbohydrates and fats.

This simple regulation of diet and exercise is sufficient in some instances to produce surprising results in benefiting the general health of the patient and correcting the metabolic disorder on which an increased blood pressure depends. With other patients it is necessary to take them out of their accustomed environment in order to secure freedom from responsibilities and worries and the time necessary to carry out proper hygienic measures. I cannot insist too strongly that no result worth securing can be attained in a short period of time. In some instances, patients have remained in sanatoriums for as long as a year, under a regimen of diet and exercise, a regimen which practically amounts to reeducation. As a general rule the treatment of hypertension cannot be carried out successfully in the home. The reasons for this become evident on a moment's thought. The object that we are endeavoring to attain is the regulation of the patient's mode of life, and for that regulation it is necessary that the patient change, first of all, his mental attitude toward his environment.

Comment has frequently been made that these patients often belong to the overbusy, driving type of successful man of affairs. Nothing can be accomplished by diet or by exercise if the incentive to drive be left unmolested. For this reason, primarily, it is my belief that early cases of hypertension should be treated in special sanatoriums. I say *special* because not every sanatorium is either equipped or conducted in a way to carry out effectively the necessary treatment. There are a few that are conducted very much along the lines of the boys' summer camp. The mental atmosphere is primarily one of sport; vigorous exercise is the rule, but in the form of games and of sports rather than in gymnasiums. The objection to gymnasium exercise is that it is more or less mechanical and does not require a concentration of attention. The mind being left free to wander, it fixes upon its customary pursuits. This is not possible in a game, and for that reason, primarily, almost any game is superior to exercise in a gymnasium.

Under a regimen in this sort of atmosphere, the patient receives a kind of reeducation, his philosophy of life is corrected, and values assume a better perspective. Physically, the flabby individual becomes hard, and all of his bodily functions are toned up accordingly. Instead of consuming more calories in food each day than he expends, he will, for a period, expend more than he consumes and lose weight in consequence.

What I have said applies particularly to the early cases of hypertension, there being as yet no significant damage to the myocardium. When there is a suspicion, or even evidence, of impaired cardiac function it is necessary to precede exercise by an adequate period of rest, and the exercise after this must be begun gradually and under careful supervision.

When it is possible to secure the cooperation of patients so that one may carry out a careful regimen through a sufficiently long period of time, elevated blood pressure in early cases is susceptible of cure.

Chart 4.—Blood pressure of a patient in whom the symptoms were largely referable to cardiac embarrassment. There was cardiac hypertrophy, sclerosis of the retinal arteries, and evidence of some impaired renal function (estimated at 15 per cent.). Rest for about two months, largely in bed, had produced no evident change in hypertension. The chart shows a summary of the next month when the diet consisted chiefly of rice, sugar, cream, butter, and fruit for fuel, and limited amounts of milk for protein.

The chief obstacles to treatment are, first, that the patient will not cooperate because he still feels perfectly well at a stage in his disorder when treatment offers the best prospect of a successful issue (Chart 5).

The second obstacle is economical in the sense that relatively few persons can afford to devote themselves exclusively, for a number of months, to the cultivation of their health. But it is well to recognize exactly in what the difficulties of treatment consist. It is not so much that the disease cannot be remedied as that the remedy is not attainable for many.

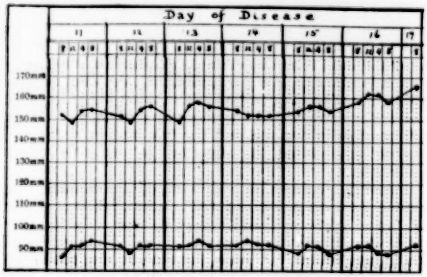


Chart 5.—Blood pressure of a man who presented very indefinite symptoms, chiefly referable to ease of fatigue. There were doubtful cardiac hypertrophy, and a slight, significant decrease in renal function. Probably there was an early stage of nephritis. This period promises best hope of cure.

When the patient cannot give up enough of his time to carry out a routine such as that outlined, the best compromise consists in directing therapeutic effort to the adjustment of the diet, so that it shall be adequate for the patient but not a surplus, and secondly, regulating the life of the patient to insure as much exercise and diversion as is compatible with his necessary routine activities.

FOCI OF INFECTION

A good deal has been said with regard to the relation of foci of infection to hypertensive disease. While there is not a vestige of evidence pointing to a causal relation of infections to hypertension, yet, on the other hand, foci of infection should not be ignored, because they predispose to the vascular and renal degenerations which are so commonly sequals of long standing increases of blood pressure. Then, too, foci of infection, whether in the tonsils or in the gallbladder, are obstacles to the return of full health. From this point of view, then, infections, of whatever origin, should be given every possible attention.

PROPHYLAXIS

This is a suitable place, perhaps, to say a word concerning the prophylaxis of vascular hypertension, since the prevention of disease must always be more important than the treatment of a person. The immediate causal factors for the basal vasomotor disorder underlying hypertension we do not, as I have already said, understand. Some general considerations are worthy of attention. Mention has already been made of the well established fact that hypertension is most commonly observed in persons who are overweight. Of course, it cannot be maintained that all who are obese consume an excess of food, but many do. Among Anglo-Saxon peoples, and in this country especially, good living is synonymous with a high protein diet; and until relatively a few years ago it was quite generally believed that such a diet was necessary for the maintenance of a high state of physical vigor. But that position cannot longer be successfully defended. Protein food is an easily utilized and highly nutritious diet, but it has the peculiar characteristic, in contrast to fats and carbohydrates, of raising the elevation of body metabolism or, as we might say, speeding up the machinery. Experiments are available which seem to indicate that a high protein diet, in animals at least, induces vascular and renal disease. Whether that is also true in human beings is not yet proved. The fact that meat-eating races seem more prone to vascular disease than vegetarian races is possibly dependent not only on diet but also on other modes of life. The subtle danger in meat diet lies in the fact that it tempts the palate and leads to the taking of more food than is necessary for the satisfaction of the appetite.

The observation of a large number of cases of hypertension has led me to believe that the disorder is far more common among those of sedentary occupations than among persons who do vigorous manual labor; and among the well-to-do the disease seems to me more common with those persons who take little or no exercise in the form of games. Considerations of this kind, I think, are helpful in suggesting the sort of advice that should be given by the general practitioner to his patients in respect to the prevention of hypertension and its associated vascular degenerations. It might perhaps be summed up in a slogan—Keep fit and Keep hard.

LATE CASES

Many cases of hypertension come first under observation at a period when the heart is already seriously damaged and when a considerable degree of arterial degeneration and sclerosis is detectable. Many of these patients also have a serious impairment of the renal functions. At this stage in the disease, little or nothing

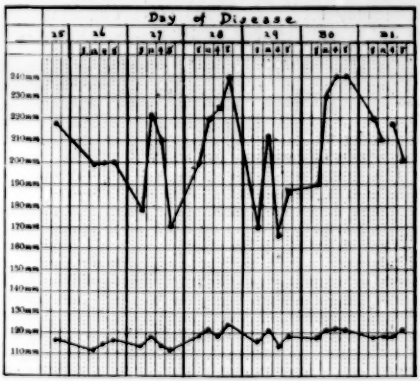


Chart 6.—Blood pressure in a very neurotic woman with a history of hypertension of years' duration. There was clear evidence, in the eye grounds, of nephritis, day and night urine volume, and functional tests. Note persistence of vasomotor instability in the systolic phase.

can be done for the treatment of hypertension. The best that can be hoped for is, through conserving strength by rest, to diminish in some degree the burden on the laboring heart. The rest treatment has been much lauded as a general method of handling cases of hypertension, but it is essentially a conservative treatment, with the idea of diminishing the rate of progress

of the disease, rather than any attempt at cure. It is doubtless true that proper rest, a sparse diet and vigorous catharsis will prolong the lives of many persons who have passed the stage for more active methods of treatment, but we must remember that these are palliative methods, and our primary object should be to detect cases at an earlier period, when there is opportunity for a better measure of success. In the later periods of hypertensive disease, acute attacks of cardiac failure may be associated with extremely high degrees of hypertension. The blood pressure in these cases may be too high to be recorded on the ordinary instruments. Since these extreme degrees of vascular tension are the immediate burden on a laboring heart, many attempts have been made experimentally at the rapid reduction of blood pressure.

I am frequently asked whether bleeding will effect this end. The immediate result of withdrawal of a pint of blood from the vein, under these circumstances, is

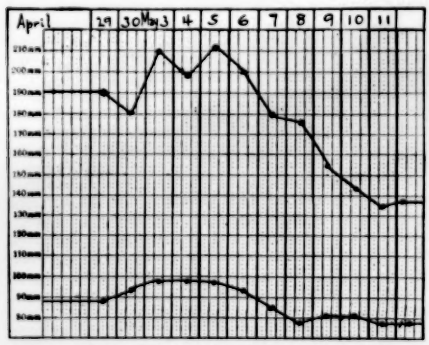


Chart 7.—Blood pressure in a patient with chronic nephritis with nitrogen retention. The usual functional tests were confirmatory. Note fall in pressure following rest in bed, influencing chiefly the systolic phase.

usually a fall in the systolic pressure of something less than 50 mm. of mercury. But this lower blood pressure seldom persists for more than six or eight hours. Consequently, little or no benefit can be expected from bleeding.

Absolute rest, with the use of sufficient sedatives, is always indicated. For the last year it has been our custom to perform lumbar puncture on all patients of this type. We have found that the cerebrospinal fluid is usually under increased pressure, and if considerable fluid is withdrawn the patient is quite often relieved of the sensation of throbbing tension in the head and, in very many cases, the blood pressure is lowered appreciably in both the systolic and the diastolic phase.

ABSTRACT OF DISCUSSION

DR. LEONARD G. ROWNTREE, Rochester, Minn.: As one who comes in constant daily contact with a large group of cases of hypertension, I want to subscribe to the soundness of the principles emphasized by Dr. Foster. He is wise in dividing these cases into groups, but the groups, as constituted at present, are very arbitrary in nature. There are some fundamental factors in relation to hypertension with which we are not familiar as yet. I am particularly interested in the emphasis laid on the time element in treatment. It is wise to consider also what is equally important and in many instances more important and in most instances more difficult to handle, viz., a prolonged regimen for the patient after he has left the institution—in other words, the follow-up system. It is not a disease of a day or a week, but in the majority of cases of years or a lifetime. Consequently, an effective follow-up system is essential to the best results. This has been a feature of treatment to which we have given great attention in Rochester. I was interested also in noting that he laid no stress on the use of drugs. This, to my mind, is correct. In the vast majority of cases, vasodilators do not accomplish much. Entirely too much emphasis has been laid on drug therapy instead of on the principles outlined by Dr. Foster. On the other hand, I object to the total omission of reference to drugs. Symptomatic relief can be brought to many patients, but adherence to the principles outlined by Dr. Foster will yield better results in the handling of cases of hypertension. We have observed a considerable number of cases with low diastolic and high systolic pressure, and some of them are extremely resistant to treatment. A considerable proportion of these cases is associated with adenoma of the thyroid. Nearly ten years ago, Dr. Henry Plummer asserted that hypertension is frequently associated with evidence of increased metabolism. As other accurate methods of determining the metabolic rate came into common use, we find that Dr. Plummer's statements in this regard are correct.

DR. LESTER J. PALMER, Seattle: Although the paper is primarily on treatment, I should like also to hear about prognosis. About a year ago, in going over histories and sending out follow-ups on a group of these cases, the point was brought to our attention that all of the patients, regardless of the treatment they had received, whose diastolic blood pressure was over 120, were either in very poor condition or dead at the end of about two years.

DR. W. W. TOMKINS, Charleston, W. Va.: What constitutes the pathologic condition of blood pressure? How low a blood pressure is compatible with health? Does a low blood pressure incapacitate a man for his work? Dr. Foster laid great stress on the fact that these cases run over a very long period of time. In other words, a man who has a low blood pressure goes to a medical life insurance examiner and is rejected. If he has no symptoms, physical or mental or otherwise, is his a pathologic condition? Should he go to a sanatorium and be treated?

DR. GEORGE E. MCKEAN, Detroit: We hear very much nowadays—apparently from some good sources—about salt in the diet. I should like to have Dr. Foster give us his ideas on that.

DR. NELLIS B. FOSTER, New York: I did not go into drug therapy at all. In the later stages of the disease when nothing else can be done, drug therapy has a place. I ignored that point because I wished to bring about the recognition of the fact that hypertension is a controllable disease. But it is controllable at a time before symptoms occur. The other form of treatment, the form we are too often confined to, unfortunately, because we do not see the patient early, is palliative treatment. In New York we see very few thyroid disorders, so I am not prepared to state whether the condition of high blood pressure that Dr. Rowntree spoke of is associated with adenoma or thyroid disease. I have wondered about idiopathic cardiac hypertrophy. A type of hypertension would be the result of such an hypertrophy and increased heart output. But it is a point I do not think we understand, and I do not want to leave the impression that we do understand very much of this. I agree with Dr. Palmer that the majority of cases in which there is an elevated diastolic pressure of 120 mm. of mercury are terminated at the end of two years. There are exceptions. There is a wavelike progression in this disease that fools frequently. That is especially so if the blood pressure is taken under varying conditions. I do not regard blood pressure as taken in the office, especially at the first examination, as being of particular value. There is excitement, and the test is unreliable. Dr. Tomkins wished to know in regard to a standard. If an adult has a blood pressure of more than 140 systolic, no matter what the diastolic may be, the

case should be regarded with suspicion. It is well to remember what the physiologic variations are. Free of excitement, free of those conditions known to elevate blood pressure, does the blood pressure persist elevated? If it does, then it is abnormal. And that is just the period when one can do the most in treatment, and it is just the period when it is hardest to get men to revise their mode of life. In regard to the salt-poor diet advocated from time to time, doubtless restrictions in salt are occasionally operative in reducing blood pressure. I doubt that it is the salt deprivation. From my observation, those who eat large amounts of salt are usually persons who eat an excessive amount of food, particularly of protein. If you restrict their salt, you destroy the appetizing feature of their food and they unconsciously eat less. It is because their food intake is less that one gets results from the salt restriction, and not because of the salt per se.

SOME RECENT ADDITIONS TO THE KNOWLEDGE OF ASCARIASIS *

B. H. RANSOM, PH.D.
WASHINGTON, D. C.

Before this Association at its session three years ago, I [1] called attention to the striking discovery made by Stewart [2] relating to the life history of the common roundworm, *Ascaris lumbricoides*, and gave some of the results of investigations on the same subject carried on by Foster and myself subsequent to Stewart's important discovery. Stewart had observed, as Davaine had done fifty years earlier, that when the eggs of this parasite in their final development were fed to rats and mice, they hatched out in the small intestine. A few hours after feeding the animals, he recovered free larvae in the feces, also in confirmation of Davaine's observations.

In addition, however, to the confirmation of these long known and comparatively insignificant facts, Stewart demonstrated that not all of the newly hatched larvae thus passed out of the body. From four to ten days after feeding his experimental animals with *Ascaris* eggs, he detected larvae in later stages of development in the liver and lungs. He observed also that rats and mice that had been fed large numbers of *Ascaris* eggs developed pneumonia within a few days after feeding, and usually died before the tenth day. Further, he observed a migration of the larvae from the lungs after they had reached a length of from 1 to 2 mm., up the trachea and then down the esophagus to the stomach and intestine. The larvae, thus returning to the intestine a week to ten days after the feeding of the eggs from which they hatched, lingered a few days in the intestine, particularly in the cecum, and finally passed out of the body in the feces without undergoing further development.

Having failed in two attempts to rear adult worms in the intestines of pigs by feeding them *Ascaris* eggs, Stewart, in interpreting the results of his experiments on rats and mice, suggested the possibility that these animals act as intermediate hosts of *Ascaris*, becoming themselves infested by swallowing the eggs scattered in the feces of human beings and pigs and, in turn, by contaminating food and drinking water with their own feces, passing on the parasites, after a partial development, to human beings and swine. From a hygienic standpoint, this hypothesis, if it were substantiated, would of course be of great importance because of its direct bearing on the question of the prevention of ascariasis. As a result, however, of other work [3] following Stewart's earlier experiments, some of which was mentioned in my paper of three years ago and concerning which a number of publications have since appeared, it may now be accepted as definitely established that rats and mice play no part as normal intermediate hosts in the life history of *Ascaris*.

The conception of the life history prevailing before Stewart's discovery has not yet been shown to require any modification so far as concerns the manner of spread of the parasites from one human being or pig to another. It is quite certain that *Ascaris* has a direct life history and that no intermediate host is required. Our present conception of the life history, however, differs from the former in that we now know, thanks to the work of Stewart, supplemented by that of other investigators who have interested themselves in the subject, that the newly hatched worms, instead of simply settling down in the intestine of the human being or pig to undergo their development to maturity, first leave the intestine, pass to the liver and then to the lungs in the blood and lymph circulations, and finally come back again to the intestine by way of the trachea and esophagus just as they would do in a rat or a mouse. The essential difference in the two cases is that in the human being or pig the larvae, when they return to the intestine after having undergone a partial development during their tour, are able then to continue their development and to reach fertile maturity, which they cannot do in a rat or mouse, or in a guinea-pig or a rabbit. It has been shown that in guinea-pigs and rabbits the larvae behave as they do in rats and mice.

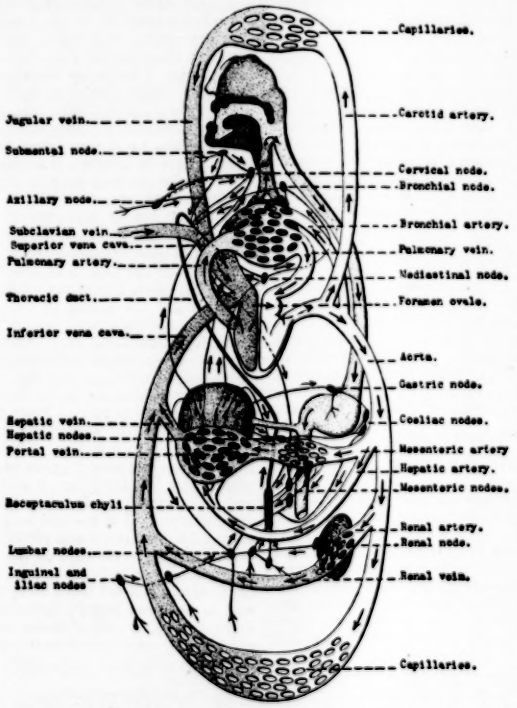
Lambs and young goats occupy an intermediate position, in their adaptability as hosts, between the smaller animals that have been mentioned and the more completely adapted hosts, man and the pig. It has been experimentally shown [4] that, in lambs and young goats, the larvae that return to the intestine after their migration through the lungs may settle down and continue their development. This development, however, at least in the case of lambs, is very slow, and apparently the worms never reach fertile maturity. From our present knowledge, it is clear that the so-called *Ascaris ovis* of sheep is nothing more than *Ascaris lumbricoides* in an unusual host. Sheep, however, are of no evident hygienic importance as carriers of the parasite, as indicated by the fact that the females of *A. ovis* have been examined in a considerable number of cases of infestation but have never been found to contain fertile eggs. In the spread of *Ascaris*, the only carriers that need be considered as of practical importance are the two common hosts of the adult parasite, man and the pig.

The roundworm of man and the roundworm of the pig are certainly of the same species. They have repeatedly been compared morphologically, and no differences have been established. Also, in complement fixation tests Bakker [5] has found that the roundworms of the

* From the United States Bureau of Animal Industry.
* Read before the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Ransom, B. H.: A Newly Recognized Cause of Pulmonary Disease—Ascaris Lumbricoides, J. A. M. A. **73**: 1210-1212 (Oct. 18) 1919.
2. Stewart, F. H.: Life History of Ascaris Lumbricoides, Brit. M. J. **2**: 5-7 (July 1) 1916; Life History of Ascaris Lumbricoides, ibid. **2**: 474 (Sept. 30) 1916; Further Experiments on Ascaris Infection, ibid. **2**: 486-488 (Oct. 7) 1916; Life History of Ascaris Lumbricoides, ibid. **2**: 753-754 (Dec. 2) 1916.
3. Ransom, B. H., and Foster, W. D.: Observations on Life History of Ascaris Lumbricoides, Bull. 817, U. S. Dept. Agric. (May 12) 1920; Stewart, F. H.: On Life History of Ascaris Lumbricoides L., Parasitology **13**: 37-47 (March) 1921.
4. Ransom, B. H., and Foster, W. D.: Footnote 3, first reference).
5. Bakker, C. R.: Over de Identiteit van Ascaris Lumbricoides en Ascaris Suilla, Tijdschr. v. Vergel. Geneesk. **6**: 160-230 (May 30) 1921.

pig and man act reciprocally in an identical manner. It is barely possible that the two forms represent distinct races or varieties, each of which is specifically adapted to its own host and unlikely, if not unable, to live in the other. Instances of such adaptations among parasites are well known. For example, among the scab mites in some genera there are forms, variously interpreted as species or varieties, that cannot be distinguished from one another by morphologic differences, yet these similar forms are more or less strictly limited to their own host species and in some cases cannot live at all on a strange species of host, though this host may be subject to infection with an apparently altogether similar parasite. From a hygienic standpoint, it is evident that such biologic differences in host relationships are of the highest importance. In the case of ascariasis, however, even if we admit that the human *Ascaris* and the pig *Ascaris* are sufficiently different biologically to prevent a successful interchange of the parasites in either direction between man and, the pig—in other words, if we assume that the pig need not be taken into practical consideration in the prevention of human ascariasis and, conversely, that the parasites cannot spread indifferently from man to the pig, there are nevertheless good reasons, which have come out of the work done in recent years, why the ascariasis of pigs must be given consideration in human hygiene.



Scheme of circulation: Arrows indicate direction of blood and lymph flow, and paths of migration of Ascaris larvae, including both theoretically possible and proved paths.

The migration of large numbers of larvae of *Ascaris* through the lungs, it has been proved,[5] may produce pneumonia not only in small laboratory animals, but also in pigs, and in addition to other possibilities of injury, the possibility is not at all excluded that such invasions, even when very slight, may be the effective means of bringing about or preparing the ground for a serious superimposed infection by other organisms, either coincidental with the worm invasion or following it, perhaps even after a long interval. The occurrence of more or less serious lung trouble as an immediate result of invasion by *Ascaris* larvae has been repeatedly demonstrated experimentally in pigs, and altogether similar occurrences have been common in the field. Many of the cases of so-called thumps, a very prevalent malady among pigs, are caused primarily by *Ascaris* larvae in the lungs. That pulmonary ascariasis of a more or less severe form occurs also among human beings cannot be doubted. In fact, one or two cases in young children, apparently of pulmonary ascariasis, have been mentioned in the recent literature,[6] and it is of interest to note that Mosler in 1867 and Lutz in 1888, long before Stewart's discovery of the migration of *Ascaris* larvae in small experimental animals, recorded the occurrence of pulmonary symptoms in human beings following the experimental administration of *Ascaris* eggs. In the light of our present knowledge it is very probable that these symptoms were the result of the invasion of the lungs by migrating *Ascaris* larvae.

It is true that human beings, because of their mode of life and their food habits, are less likely than pigs to ingest a sufficiently large number of *Ascaris* eggs at one time to cause a heavy invasion of the lungs by the larvae, but the possibility of such an occurrence is not remote, especially in the case of children exposed to close contact with soil that has been heavily polluted by feces either of human beings or of swine. So far as the invasion of the human lung by *Ascaris* larvae is concerned, it is proper to assume, for all practical purposes, that it makes no difference whether the parasites are of human or of suilline origin. Hence, in reference to pulmonary ascariasis, the conservative hygienist must take the position that heavy fecal contamination of the soil is likely to be equally dangerous to human beings, whether the contamination originates from human beings or from pigs.

In view also of the suggested possibility that very slight invasions of the lungs by *Ascaris* larvae may be followed more or less remotely by serious secondary or indirect consequences, it is evident that the protection

6. Steiner, G.: Neure Forschungsergebnisse über die Lebensgeschichte der Ascaris Lumbricoides und ihre medizinische Bedeutung, namentlich als Ursache von Pneumonie, Schweiz. med. Wchnschr. **50**: 334 (April 22) 1920.

of human beings from ingestion of even small numbers of the eggs of the pig *Ascaris* is a matter of potential hygienic importance, irrespective of whether such ingestion results in the development of egg-producing adult worms in the intestine. Moreover, the invasion of the liver, spleen, lymph nodes, thyroid, brain, kidneys and other organs besides the lungs by *Ascaris* larvae affords an additional reason for avoiding the ingestion of the eggs in either large or small numbers, not merely of the human *Ascaris* but also of the pig *Ascaris*.

How the larvae reach these various locations is indicated by the accompanying diagram. The larvae that hatch out in the small intestine, after the eggs containing them have been swallowed, promptly enter the wall of the intestine; they then pass to the liver in the portal circulation and, after crossing the capillary zone of the liver lobules, enter the central veins, by which they reach the hepatic veins, vena cava and right side of the heart. The newly hatched larvae measure about 0.25 mm. in length and about 0.012 mm. in diameter. They may pass rapidly through the liver or be delayed for several days, in the latter case undergoing growth and development, before they continue their journey. Some larvae may be permanently stopped in the liver, become encapsulated and die there. From the right side of the heart, the larvae are carried to the lungs, in which they enter the air sacs. Finally, after having developed to a length of from 1 to 2.5 mm. they pass up the trachea and down the esophagus through the stomach to the intestine, and develop to maturity in about two months. Some larvae that reach the lungs, however, apparently again return to the heart, and are then distributed to various parts of the body in the peripheral circulation. They may be recovered from peripheral lymph nodes as early as twenty-four hours after the eggs from which they hatched have been swallowed, and have been found still alive in such locations as late as thirty days after infection. Fülleborn[7] has recovered them from the brains of experimental animals.

In cases in which there is an open foramen ovale, it is theoretically possible that the larvae may reach the peripheral circulation by passing directly from the right to the left side of the heart without going through the lungs. The presence of the larvae in the peripheral lymph nodes of experimental animals in whose hearts the foramen ovale was closed would seem to preclude the possibility of their direct passage from the right to the left side of the heart, and force the conclusion that they had passed through the lungs. As to the possibility that the larvae in peripheral lymph nodes might have followed the lymphatics exclusively, it is inconceivable that in a few hours they could have worked their way for the distance they would have to travel by this route against the lymphatic current and past intervening lymph nodes and the valves of the lymph vessels. It should be mentioned that some larvae that hatch in the intestine, instead of passing directly to the liver in the portal system, find their way in the lacteals to the mesenteric nodes; some of the larvae that reach these nodes succeed in escaping from them, in some cases perhaps passing to the liver in the portal circulation, in other cases perhaps to the chyle receptacle in the lymph circulation and then, of course, to the right side of the heart by way of the thoracic duct, these two alternatives appearing more likely than that the larvae escape into the body cavity. Details of the experiments in which the migrations of *Ascaris* larvae in the body have been followed step by step, have been given in another paper.[8]

Another point of importance which has been made evident by recent work on *Ascaris* is that in the case of pigs, and probably also in the case of human beings, though perhaps in less degree, it is the young animal which is most susceptible to *Ascaris* infection and also most liable to suffer seriously from pulmonary ascariasis.[3] As the pig grows older, more or less complete immunity generally develops within a few months, often to a considerable degree within a few weeks. In case such older pigs swallow infectious *Ascaris* eggs, the worms hatching in the intestine do not succeed in effecting their migration and development or, if some of them do succeed, they cause no conspicuous disturbance. Available evidence indicates that this immunity or resistance to infection is related to age rather than to earlier infections, the pig becoming more resistant because of increasing age and not because one invasion by the parasites has a protective action against later invasions. It is barely possible that there may be also an immunity of the latter sort, but age in itself is an important factor in the production of complete or partial immunity to *Ascaris* infection.

The decreasing susceptibility to *Ascaris* infection that comes with advancing age is an exceedingly important point in the control of ascariasis among pigs, and has been taken advantage of in the development of methods for preventing or minimizing worm losses.[9] By taking special precautions to protect the young pigs from infection until they reach an age of about 4 months, a very remarkable reduction in the losses of young pigs from ascariasis and associated diseases has been accomplished on many farms in which formerly heavy losses occurred. Under usual farm conditions in which a plan of prophylaxis designed to protect pigs of all ages from infection would be practically impossible, a plan designed to give special protection to the young pigs has been found which is easily applicable and economically profitable. In the case of children, age immunity, if it may be so called, is evidently not so rapidly established and perhaps never so completely established as in the case of pigs. Moreover, the fact that among people living under fair sanitary conditions children as a rule are more likely to harbor roundworms and to be more heavily infested than adults may be more dependent on differences in habits involving greater exposure to infection in the case of children than on a difference from adults in their susceptibility to infection.

Age immunity to parasites commonly varies in the case of the same species of parasite with different species of hosts. For example, chickens are readily susceptible to and likely to be seriously injured by infection with the common gapeworm (*Syngamus trachealis*) only while still quite young.[10] Adult chickens rarely harbor gapeworms. On the other hand, turkeys of all ages show little difference in the readiness with which gapeworm infection may be brought about experimentally, and gapeworms may occur naturally in a high percentage of adult turkeys in the same localities in which none can be found in adult chickens,

7. Fülleborn, F.: Ueber Ascaridenlarven im Gehirn, Vorläufige Mitteilung, Arch. f. Schiffs. u. Tropen-Hyg. **25**: 62-63.

8. Ransom, B. H., and Cram, E. B.: Course of Migration of Ascaris Larvae, Am. J. Trop Med. **1**: 129-139 (May) 1921; Course of Migration of Ascaris Larvae from Intestine to the Lungs, Anat. Rec. **20**: 207 (Jan. 20) 1921.

9. Ransom, B. H.: Prevention of Intestinal Worms in Pigs, J. A. Vet. M. A. **59**: 711-715 (Sept.) 1921.

10. Ransom, B. H.: The Turkey an Important Factor in the Spread of Gapeworms, Bull. 939, U. S. Dept. Agric., April 23, 1921.

although common enough in young chickens in these localities as in turkeys of all ages. Because of these facts and because of other evidence, it would seem that the turkey is the natural host of the gapeworm, the host with which it has been the longer associated and on which its continued existence as a species is particularly dependent, and that the chicken is merely an incidental host to which the gapeworm is rather poorly adapted and with which also its association has been comparatively recently established.

It is possible that the relationship of *Ascaris* to its two hosts is somewhat similar to that suggested in the case of the gapeworm. The differences in the adjustment of *Ascaris* to its two hosts are less marked, however, than the differences in the adjustment of the gapeworm; and although it seems probable, considered from an evolutionary standpoint, that of its two hosts, man is the older, better adapted and more essential host of *Ascaris lumbricoides*, and that the association of the parasite with the pig is more recent, more casual, and less adequate to its continued existence as a species, our present knowledge is too incomplete to justify the acceptance of such a view, except as a hypothesis for further examination. This hypothesis is advanced merely as a suggestion, which at this time it would be useless to attempt to support by argument, because the facts now available are not sufficient either to prove it or to disprove it. I have ventured to mention it, however, because, in addition to whatever value it may have as a working hypothesis, it may be useful from a practical standpoint in reminding us that the problem of *Ascaris* control is perhaps essentially more difficult in the case of man than in the case of the pig, and that even if due allowances are made for the evident differences between the two hosts in their habits and environmental relationships, there may be yet other and less apparent differences between the two, in the relation of host and parasite, that are profoundly important and of such a nature as to require much more stringent control measures to secure successful results in the one case than in the other.

THE CONGENITAL FACTOR IN CHRONIC RENAL DISEASE *

EDWARD WEISS, M.D.
Associate in Pathology, Jefferson Medical College.
PHILADELPHIA

The purpose of this report is to record briefly the clinical notes and pathologic findings in three uncommon cases of chronic renal disease occurring in comparatively young persons, associated with a marked degree of nitrogen retention and running a rapidly fatal course. In addition, because of the absence of a definite etiologic factor, together with an unusual appearance of the kidneys at necropsy, the importance of a congenital basis is emphasized, as an etiologic factor in these and similar cases.

REPORT OF CASES

CASE 1.[1]—J. M., a white man, aged 37, a policeman for the last fifteen years, who was admitted to the Jefferson Hospital in the service of Dr. H. A. Hare, April 12, 1921, complained of shortness of breath. His family history was negative. He had had typhoid fever at 13, gonorrhea at 22 and influenza at 33, from all of which he had apparently made a good recovery. For the last two or three years, he has had to get up once or twice at night to urinate, but otherwise he enjoyed good health until seven weeks prior to admission, when he was suddenly seized with dyspnea during the night, and this had continued.

The patient was fairly well nourished and had marked pallor. The area of cardiac dulness was somewhat increased to the left; the blood pressure on admission was 220 systolic and 180 diastolic; there was no edema. Urinalysis revealed a cloud of albumin and a few hyaline and granular casts. Hemoglobin was 56 per cent.; the Wassermann test of the blood and spinal fluid was negative. Eye ground examination disclosed a moderate albuminuric retinitis. The phenolsulphonephthalein test gave only traces of dye elimination in two hours. The two hour test of urine indicated a fixation of specific gravity at about 1.011 and a total volume, in the twenty-four hours, of 1,080 c.c.

The general condition of the patient grew steadily worse; his nocturnal dyspnea increased in severity. April 19, seven days after admission, he became drowsy and developed a persistent diarrhea, which continued for three days before yielding to treatment. He vomited occasionally and, April 26, a pericardial friction rub was heard. May 1, there was a decided change for the worse, and death occurred, May 4.

Of greatest help from a prognostic standpoint were the estimations for nitrogen retention in the blood. An initial blood urea nitrogen of 93 mg. rapidly rose and, twelve hours before death, eighteen days later, reached 304 mg. The creatinin, 13 mg., and nonprotein nitrogen, 401 mg., paralleled this remarkable rise in the urea nitrogen.

The necropsy, performed on the day of death, revealed a marked chronic interstitial nephritis, arterial disease, and left-sided cardiac hypertrophy, with an ulcerative colitis and serofibrinous pericarditis.

The kidneys weighed only 80 gm. each, and did not present quite the usual picture of marked chronic nephritis, in that they were not so coarsely granular; advanced scarring was not a feature, and there was no increase of pelvic fat; in other words, the kidneys seemed naturally small, rather than atrophic. The microscopic picture was that of a marked chronic interstitial nephritis with great fibrous tissue increase, thickened capsule, shrunken and fibrosed glomerular tufts, periglomerular small cell infiltration, atrophy and dilatation of tubules, the formation of retention cysts, and sclerosis of the blood vessels.

Summary: A congenital basis for this case of renal disease is suggested by the absence of a definite etiologic factor in the history and physical examination of this comparatively young man, who had shown a rapidly progressive loss of renal functional power, an enormous nitrogen retention and death from asthenic uremia; with the findings at necropsy of kidneys which appeared hypogenetic rather than atrophic, and with but slight sclerosis of the systemic bloodvessels.

CASE 2.—S. K., a white man, aged 26 years, who was first admitted to the tuberculosis wards of the Philadelphia General Hospital, Nov. 16, 1921, gave a history of a dry, hacking cough of five or six years' duration; pain in the chest; blood-tinged sputum in the last month or two, and a loss of 40 pounds (18 kg.) in weight in the last four months. A good history could not be obtained, as the patient was a foreigner and spoke English with difficulty; but later the further facts were elicited that about five months previously he began having severe frontal headaches, epigastric discomfort and vomiting after meals, and edema of the face and ankles. For the last three or four years, he had had nocturia. He was transferred to the medical wards, in the service of Dr. Riesman, November 23.

The family history of the patient was unimportant except that his father died at 56 of "kidney trouble." His own history disclosed nothing important; he did not recall the diseases of childhood, and denied venereal disease and the use of alcohol. He had a slight attack of influenza in 1918.

The patient was fairly well nourished; there was slight edema of the face. The heart was slightly enlarged; the

* Read before the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Reported from the standpoint of nitrogen retention by Weiss Edward, and Garner, V. C.: J. Lab. Clin. Med. 7:229 (Jan.) 1922.

peripheral vessels were soft; the pulse was 90; the systolic blood pressure was 180; the diastolic, 135.

Urinalysis revealed a specific gravity of 1.010, a cloud of albumin, and occasional granular casts. The patient failed to eliminate any of the dye in two hours in the phenolsulphonephthalein test. Examination of the eye grounds disclosed an albuminuric retinitis with hemorrhages.

November 23, a pericardial friction was heard, and this persisted until December 5, about which time the the patient became stuporous, and died, December 15.

November 22, the blood urea nitrogen was 126 mg., and creatinin 7 mg. Both abruptly rose, and the day before the death of the patient, twenty-two days later, had reached tremendous figures: 327 mg. of blood urea and 20 mg. of creatinin.

Necropsy, the following day, revealed an advanced chronic interstitial nephritis; hypertrophy of the heart; hydroperitoneum and bilateral hydrothorax; hemorrhagic pericarditis, and a slight degree of atheroma of the aorta.

The kidneys were small, the left weighing 115 gm., the right, 95 gm., and fairly firm, but the capsules stripped easily and left finely granular surfaces. The incised surfaces were pale; the cortices were only slightly narrowed, and the pelvic fat had not increased in amount.

The microscopic picture was that of a well advanced chronic interstitial nephritis with a superimposed acute tubular lesion.

Summary: This rapidly fatal chronic nephritis in a young man, associated with very marked nitrogen retention, the absence of a definite etiologic factor and, again, the appearance at necropsy of kidneys which seemed naturally small rather than shrunken, suggests in this case even more strongly than in the former one, because of the younger age, a congenital basis. The microscopic finding of a superimposed acute tubular lesion suggests that this was the determining cause of death and that, up to the time at which this lesion occurred, the kidneys were sufficient for ordinary demands, breaking down under the strain of an acute lesion probably brought about by a slight cause—an otherwise negligible infection.

CASE 3.—M. H., a white girl, aged 15, who was admitted to Jefferson Hospital in the service of Dr. Loux, Dec. 13, 1921, complained of pain in the left side of the back, weakness and severe headache. One brother, a pale and poorly developed lad, died at the age of 18 of "kidney trouble." The mother later stated that this boy's illness was very similar to his sister's, and that death occurred in the same manner. Otherwise the family history was negative. The patient had whooping cough at the age of 2 and measles at 4, but no other infectious diseases, and had always enjoyed fairly good health. The menses were established at 13, but had not been present since September, 1921.

The present illness began in the latter part of September, 1921, with pain in the left side of the back that had a tendency to radiate to the groin. With this she had chills and fever, and was confined to bed for two weeks. Since then she had been up and about, but had not felt well enough to go to school. Occasionally she had chilly sensations and pain in the back at night. During the two weeks prior to admission, she had a recurrence of her former symptoms; pain in the left flank, severe headache, attacks of vertigo, nausea and vomiting, and marked burning on urination, but a decreased frequency. She voided only once daily, and then only a small amount of dark colored urine. There was edema of the face in the morning, which disappeared later in the day.

She was pale and moderately well developed; the temperature, pulse and respiration were normal. The blood pressure was 120 sytolic, and 80 diastolic. The urine had a specific gravity of 1.010, a heavy cloud of albumin, red and white blood cells in abundance, and occasional hyaline and granular casts. Blood examination revealed: hemoglobin, 43 per cent.; red blood cells, 1,980,000; white blood cells, 20,300. The blood nitrogen retention, December 18, was very marked; the urea nitrogen, 240 mg.; the nonprotein nitrogen, 300 mg., and the creatinin, 3.1 mg. The eyeground examination was negative. Urine culture demonstrated the colon bacillus.

Cystoscopy revealed the left ureteral orifice normal; the right, slightly inflamed; ureteral catheterization was unsuccessful. The indigocarmin test indicated no excretion from either side in twenty-five minutes.

Roentgen-ray examination disclosed considerable gas in the abdomen blurring the outline of the kidney. There was a dense calcareous shadow in the region of the right upper abdomen.

During her ten days in the hospital, the patient voided only 3.5 liters of urine. She became progressively weaker, more and more stuporous, and died, December 23.

Necropsy, limited to the abdomen, was performed the same day. Both kidneys were small, each weighing 70 gm. The capsule of the left kidney stripped readily, leaving a finely granular, grayish-red surface; the organ cut with markedly increased resistance; the cut surface was pale and the cortex uniformly narrowed; the pelvis and ureter appeared normal, and the renal vessels were smooth and soft. The right kidney was very similar in appearance, but had a dilated pelvis that was intensely inflamed, and contained a stone, which measured 3 by 2.8 by 1.5 cm. The ureter was also dilated and inflamed.

Microscopically, the kidneys were extensively fibrosed. The glomeruli, except for the swelling due to dilated capillaries, seemed but little affected, although the capsules of Bowman were almost universally greatly thickened. A striking feature was the presence, in many of the tubules, of calcific deposits that stained deeply purple. These occurred in the lumina or in the epithelial cells. Tubules in all parts of the kidney, from capsule to pelvis, were affected, and the process was even more pronounced in the right kidney. The pelvis of the right kidney was fibrous, showed leukocytic infiltration, and had lost most of its epithelial covering. The right ureter also showed desquamation of epithelium, and the lumen contained epithelial cells, leukocytes and many masses of calcareous substance.

The condition of the patient was diagnosed as chronic interstitial nephritis associated with extensive tubular deposits of calcium salts, and nephrolithiasis of the right kidney, pyelitis and ureteritis.

Summary: The finding of small, fibrosed kidneys with considerable calcific deposit[2] in a girl of 15, who had shown a rapidly progressive loss of kidney functional power with no previous infection worthy to be considered a causative factor, and a history of a similar condition in a brother who died at the age of 18, strongly suggest a congenital basis. This hypothesis becomes even more attractive if we assume that, although her kidneys had been below par since birth, they were capable of meeting the ordinary demands of kidney function, and showed functional incapacity only when subjected to the strain induced by a large kidney stone and an associated infection.

COMMENT

While frequent references have been made to hereditary and congenital factors in arterial disease, insufficient attention has been paid, in my opinion, to the same factors in the determination of a renal lesion. Coplin,[3] however, has for many years contended that there is a type of renal anomaly of developmental origin which predisposes to, or renders inevitable, some form of nephritis. He refers particularly to hypogenesis, and believes that the original fault is probably primarily a defective arteriogenesis. He concludes that nephritis or uremia coming on in young persons without adequate cause should arouse our suspicion of this type of renal lesion.

2. Kidd made a similar observation in a study of Bright's disease extending through three generations (The Inheritance of Bright's Disease of the Kidney, Practitioner, London **29**: 104, 1882). He found extensive calcium deposits in the kidneys in two cases of chronic renal disease occurring in young persons.

3. Coplin, W. M. L.: Unilateral Renal Hypoplasia and Dysplasia Due to Defective Arteriogenesis; Relation to So-Called Hypogenetic Nephritis, Am. J. M. Sc. **153**: 381 (March) 1917.

V. 19

Ringer,[4] from a clinical point of view, expresses his dissatisfaction with our present views in regard to the etiology of nephritis, stating as his belief that the various infections and intoxications which are usually held to be responsible play but a secondary rôle, i. e., merely an exciting rôle, and that the primary seat of trouble lies in the kidney itself. He says, "We can readily conceive of organs in the human body at birth being of functional capacity below par." He quotes Stockard as saying: "Every person dies from the disease with which he is born, . . . and . . . during the period of differentiation the organ is marked out which is the weak link in the chain." Ringer then concludes that, so long as the individual remains well, the renal condition goes unrecognized; but any insult, in the form of infection, or any strain, as pregnancy, may cause a break in the weak link, with the onset of a clinically recognizable nephritis.

Babes[5] has observed six cases of chronic renal disease occurring in young, frail and anemic subjects, usually under the age of 30, with no history of previous nephritis or conditions supposed to cause nephritis. In each case, a slight infection precipitated a sudden grave uremia, with coma and death in a few days. In a discussion of the kidney findings at necropsy, he mentions an excessive diminution of volume and certain characteristics of indurated and granular atrophy, or of arteriosclerotic kidney, differing essentially from the two forms or their combination. Therefore he states that in these cases it is not a question of ordinary sclerotic nephritis, of simple arteriosclerosis, of insufficiency of the arteries or of a combination of these pathologic processes, but rather a particular state of the kidney: a true hypogenesis. He believes that during the lifetime of the individual the kidneys are at the limit of their capacity, and that a comparatively minor infection results in a fatal uremia. He concludes that one must think of a nephritis grafted on a hypogenetic kidney if, in a young poorly developed subject without renal antecedents but with hypertrophy of the heart, a fulminating uremia follows a slight malady.

CONCLUSION

It is impossible, of course, to be certain regarding the etiology of the renal lesion in the three cases on which this report is based. It does seem, however, that they correspond closely to those outlined by Babes. The subjects may therefore be regarded as individuals congenitally predisposed to the development of a renal lesion, probably because of a "weak link" (hypogenetic kidneys) in the cardiovascular-renal chain, with a determining factor in the form of an infection or strain resulting in the rapid onset of a fatal uremia.

It is obvious that such a suggestion, partly based on the gross and microscopic appearance of the kidneys, is not in keeping with the modern clinical classification of nephritis on a functional rather than a structural basis. But I do not believe we are wholly justified in disregarding the appearance of the kidneys at necropsy and, although the justice of the present day clinical classification is acknowledged, still it is to be regretted that the tendency is away from the pathologic basis, which is necessary for a just conception and further progress in the study of disease.

1906 Walnut Street.

4. Ringer, A. I.: Chronic Nephritis, from the Point of View of the General Practitioner: Its Diagnosis, Prognosis and Treatment, Am. J. M. Sc. **161**: 798 (June) 1921.
5. Babes, V.: La néphrite hypogénétique, Semaine méd. **25**: 63 (Feb. 8) 1903.

A STUDY OF EXOPHTHALMIC GOITER AND THE INVOLUNTARY NERVOUS SYSTEM

VIII. A CLINICAL AND LABORATORY STUDY OF THE INVOLUNTARY NERVOUS SYSTEM *

CHARLES C. LIEB, M.D.
HAROLD THOMAS HYMAN, M.D.
AND
LEO KESSEL, M.D.
NEW YORK

Our clinical study [1] of exophthalmic goiter suggested an investigation of the involuntary nervous system. The manifestations of exophthalmic goiter may be divided into the metabolic disturbance measured by the basal metabolism, and the sympathomimetic symptoms (tachycardia, exophthalmos, polyrrhea, sweating, etc.). The latter have been so called because they may be produced by stimulation of the thoracicolumber division of the involuntary nervous system. Not all persons with sympathomimetic symptoms have elevation of the basal metabolism. To a clinical association of sympathomimetic symptoms and normal basal metabolism, we have applied the term "autonomic imbalance." [2]

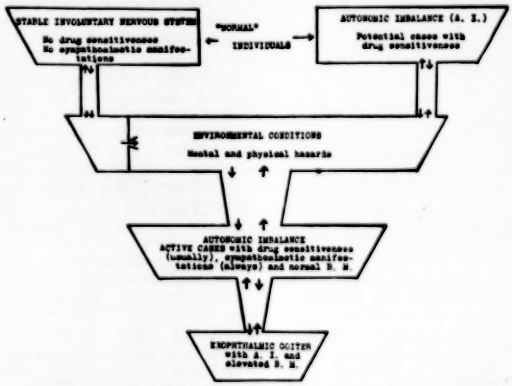
Our clinical studies of autonomic imbalance failed to reveal the predisposing causes. The exciting causes may be divided into physiologic and pathologic. The most prominent physiologic factor is the sex epochs, particularly in the female, and the most frequent pathologic factor is foci of infection in the nasopharynx. Our patients showed considerable range in their symptoms: In some but one organ, such as the heart, was involved; in others the symptoms were so widespread that there was a general imbalance.

The commonest symptom was lability of the pulse rate, and in every patient an apparently idiopathic tachycardia was present at one time or another. Thyroid enlargement was second in frequency. About 20 per cent. of the patients presented one or more of the eye signs of exophthalmic goiter. A tremor was noted in about one fifth of all patients. In 84 per cent., both tachycardia and goiter were present; in 12 per cent., tachycardia, goiter and eye signs; in 10 per cent., tachycardia, goiter and tremor; and in 11 per cent. of the eighty-six patients, the four clinical cardinal symptoms of exophthalmic goiter were simultaneously observed. In only one of the eighty-six patients was basal metabolism elevated, and in her it was found only in the first of three determinations. It is apparent, therefore, that while these persons presented many or even all of the classical clinical symptoms of the textbook picture of exophthalmic goiter, they did not suffer from that disease. The necessity for accurate differentiation from exophthalmic goiter was urgent. Nearly all had been told that they were suffering from thyroid disease, and many had already received specific treatment referable to the thyroid gland.

* From the Department of Medicine, Mount Sinai Hospital, and the Department of Pharmacology, College of Physicians and Surgeons.
* Read before the Section on Pharmacology and Therapeutics at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.
1. Kessel, Leo, and Hyman, H. T.: A Study of Fifty Consecutive Cases of Graves' Syndrome, to be published.
2. Kessel, Leo, and Hyman, H. T.: The Clinical Manifestations of Disturbances of the Involuntary Nervous System (Autonomic Imbalance, to be published.

Interesting phenomena were frequently encountered in those patients suffering from symptoms referable to but one organ. Six patients had such prominent cardiac symptoms that they had previously been treated in cardiac clinics. In addition to tachycardia, there were various abnormalities in the cardiac rhythm: extrasystoles, auricular flutter and paroxysmal tachycardia. The general picture was that of the cardiac war neuroses. The abdominal symptoms resembled closely the clinical picture of gastric or duodenal ulcer or of "chronic appendicitis." Neuroses or psychoneuroses were observed in six patients; the most prominent were of the anxiety and sexual types. In almost every case a diagnosis of disease of the organ presenting the symptoms had previously been made, and in none was the rôle of the involuntary nervous system recognized.

In attempting to discover a pathognomonic clinical test, we were led to investigate the response to various drugs, especially atropin and epinephrin. As controls, two groups of "normal" persons were studied: thirty medical students at the College of Physicians and Surgeons, and fifty convalescents at Mount Sinai Hospital. Of these "normals," a few gave evidence of a mild grade of autonomic imbalance, but 33 per cent, reacted to epinephrin and 25 per cent. to atropin. This indicates that abnormal drug reactions can exist in the absence of active autonomic imbalance. Drug tests were made on a few patients with active autonomic imbalance and fifty cases of exophthalmic goiter. The type of reaction did not permit clinical grouping into sympathicotonia and vagotonia; the intensity of drug reactions did not parallel the severity of the presenting symptoms. Only 6 per cent. of these patients failed to react to one or the other drug. The absence of response may be explained pharmacologically: epinephrin stimulates the myoneural junctions of the thoracicolumbar, and atropin paralyzes those of the bulbosacral division of the involuntary nervous system. These responses are not indicative of the tonicity of the involuntary nervous system.



Rôle of involuntary nervous system in "normals," autonomic imbalance and exophthalmic goiter.

In our animal experiments [3] we attempted to find an index of the activity of the involuntary nervous system, and through it to study the natural and artificial regulation of this system. The response of the pithed cat to repeated injections of similar doses of epinephrin was finally accepted as the most serviceable index obtainable. It was soon found that epinephrin repeatedly injected at short intervals caused a progressively increasing vascular response, which we interpret as an artificial "sensitization." An analysis of this phenomenon was undertaken in the hope of throwing light on the mechanisms of autonomic imbalance and exophthalmic goiter. The negative effects of extirpation and of injections of potent extracts of various ductless glands excluded them as participants in the sensitization (thyroid, suprarenal, parathyroid, spleen and kidney, by ablation; thyroxin, epinephrin, pituitary extract and ovarian extract, by intravenous administration). Since every known variable was carefully controlled, we were forced to conclude that the phenomena of sensitization were the result of a physicochemical change induced by epinephrin and involving the myoneural junctions of the thoracicolumbar system. We disagree with the interpretation that an increased response to epinephrin signifies hypersecretion of the thyroid. We have found no evidence that thyroxin increases the epinephrin response; [4] we have produced sensitization in the absence of the thyroid; we have found sensitiveness to epinephrin in a large number of "normal" human subjects. We are therefore convinced that the epinephrin reaction (Goetsch) is independent not only of the normal but also of the hyperplastic thyroid gland. We also believe that an increased reaction to epinephrin is no indication of excessive tonus of the thoracicolumbar [5] (sympathicotonia). Confirmation of our belief is found in the law that a tissue in high tonus is less reactive to a stimulus than the same tissue in a state of low tonus or atony. Therefore, an increased response to epinephrin is suggestive of a low rather than of a high tonus of the thoracicolumbar.

Attempts to alter the epinephrin response of the pithed cat were made with a view to a therapeutic application of the findings. Injections of the buffer salts (sodium acid phosphate, sodium carbonate and sodium bicarbonate); of the cations (sodium [Na^+], hydrogen [H^+], potassium [K^+] and calcium [Ca^{++}]); of the anions (chlorid [Cl^-], sulphate [$SO_4^=$], carbonate [$CO_3^=$], bicarbonate [HCO_3^-], acid phosphate [$H_2PO_4^=$], iodid [I^-], bromid [Br^-], oxalate [$C_2O_4^=$] and citrate), and of the alkaloids (morphin, atropin, physostigmin), failed to alter the reaction. Magnesium sulphate depressed strongly, and cocain augmented greatly the degree of the response.

Previous workers, using the same preparation and obtaining similar results, have invariably interpreted

3. Lieb, C. C., and Hyman, H. T.: The Vascular Response of the Pithed Cat to Single Intravenous Injections of Adrenaline; The Vascular Response of the Pithed Cat to Repeated Injections of Equal Doses of Adrenaline; Attempts to Alter the Vascular Response of the Pithed Cat to Repeated Injections of Similar Doses of Adrenaline; On the Mechanism of the Sensitization of the Pithed Cat to the Subcutaneous Injections of Adrenaline, to be published.

4. Levy, R. L.: Studies on the Conditions of Activity of the Endocrine Glands, Am. J. Physiol. 40:1492 (Oct.) 1916.

5. Eppinger and Hess: Vagotonia.

this "sensitization" as a specific hormone effect. That the sensitization is not a hormone effect is amply demonstrated by our inability to obtain sensitization with thyroxin and other hormones, and by the occurrence of sensitization after extirpation of the endocrine glands. The factors regulating the tonicity of the involuntary nervous system remain unknown. There is certainly no proof that they are the secretions of the ductless glands; nor have we been able to find any evidence in support of a theory assuming that these hormones are capable of acting as emergency stimulants of the involuntary nervous system. It seems unwise to designate the conditions of exophthalmic goiter and autonomic imbalance as endocrine disorders, and we therefore favor the abolition of such terms as "hyperthyroidism", "dysthyroidism" and "suprarenal insufficiency."

Autonomic imbalance presents all the symptoms of exophthalmic goiter with the single exception of increased basal metabolism. The majority of patients presenting exophthalmic goiter give a history, past or present, of autonomic imbalance. The actual transition from autonomic imbalance to exophthalmic goiter has been observed. The transition is characterized by an augmentation of the symptoms of autonomic imbalance plus a metabolic upset, as evidenced by an elevated basal metabolism.

Though thyroid enlargement and autonomic imbalance may be independently present, their frequent association is probably more than a mere coincidence. The causative relation between these has not yet been determined, but it seems improbable that thyroid hyperplasia is the cause of the imbalance.

We have but one therapeutic suggestion to offer—namely, the use of atropin in disturbances of the bulbosacral division of the involuntary nervous system. Whether tonus is increased or decreased, atropin may be employed. If the tonus is low, small doses are indicated; they stimulate the center without affecting the nerve endings. If the tonus is high, large doses paralyze the endings and nullify the excessive central action.

ABSTRACT OF DISCUSSION

DR. A. J. CARLSON, Chicago: This report deserves attention because of the analytic and critical manner of attack of a problem, not infrequently considered settled. If "hyperthyroidism" was more frequently subjected to similar searching analyses, we should make more rapid progress in this difficult field. There is a tendency among internists to consider the visceral nervous system and the endocrine glands as being supplementary, if not identical, in function. I need not say that theories and therapies based on this assumption are not only guesswork, but probably in many instances wrong guessing at that. The uncritical use of such terms as "hyperthyroidism," "vagotonia" and "sympatheticotonia" in the sense of established etiology of well known disease complexes retards medical progress. I hope that the authors themselves regard their present work as a "report of progress," rather than as a final conclusion. I further hope that they will also give some attention to the sensory side of the visceral nervous system. It is not improbable that visceral sensory factors may raise the basal metabolic rate above the normal, even without reflex hyperactivity of any endocrine gland. Physiologists are now gradually realizing that we must be careful in drawing physiologic conclusions from experiments on animals under anesthesia. That is equally true of experiments on decerebrated animals, at least for two or three days after the decerebration, because of shock.

DR. H. T. HYMAN, New York: We used very little anesthesia, just enough to do a tracheotomy. So we feel that it was not a factor. Sometimes the epinephrin injection is not made for two or three hours afterward. We are unable to keep the animals alive more than seven or eight hours. We have never been able to keep an animal alive over night. The English institutes can do that but we cannot, despite the fact that we use as ideal conditions as possible. A number of things the speaker said are of extreme importance. I should like to call attention to one point particularly. The relations between the sympathetic and vagus are not clear. Most people have the conception that the systems are antagonistic. For instance, if one gives small doses of atropin one may stimulate the vagus center; if large doses, one paralyzes, so that one gets certain antagonistic effects. If one uses small doses, one gets depressor effects; if large doses, pressor effects. We have seen it in the same animal and converted the depressor effect to a pressor effect, so that one cannot try to reach conclusions as to the effects of these drugs. The dosage is not the same for the same animal at the same time, or different times. In other words, there is an extreme variability in this whole business. Then, of course, different animals have different tonus in regard to their vagus and sympathetic systems. As to a conclusion about the drug reaction clinically, it is simply impossible to determine the positive reaction of the drug. The tendency of the endocrinologist and the drug therapy salesmen is to attribute all the things enumerated to upsets in the various hormones. There is no proof of it.

A NEW METHOD OF CLOSING THE EUSTACHIAN TUBE IN THE RADICAL MASTOID OPERATION

NORVAL H. PIERCE, M.D.
CHICAGO

Failure to secure a dry ear, following the radical mastoid operation, which has for its purpose the cure of suppurative ear disease, is due almost exclusively to an open eustachian tube, the persistence of hyperplastic mucosa and the presence of dead bone. Of these factors the former is the most frequent cause of failure. The matter may be stated in this way: With a patulous tube, a permanently dry ear is impossible, no matter how successful we may be in removing the hyperplastic mucosa and dead bone. Such failures are estimated by different writers at from 10 to 50 per cent. Various methods to secure closure of the tube have been employed, but though the technic of any of them may be as closely followed as possible, the results, so far as concerns closure of the tube, are always uncertain. It is the experience of competent operators that they may follow precisely the same technic in, say, three cases, and in one there results a closed tube, while in the others there remains a widely patulous or only a partially closed tube.

THE PROBLEM

The eustachian tube consists of two parts, a movable and an immovable part. The movable part is composed of cartilage and soft tissue, and is closed except when certain movements of the pharynx and velum palati cause it momentarily to open. When the muscular acts which cause the tube to open cease, the tube is again closed, with the result that the air which entered it during the open phase is forcibly injected into the bony or immovable portion and thence into the cavum. The immovable portion is a bony canal and the point at which the two portions join is the most constricted portion of the tube, called the isthmus. Surgical attempts at closure of the movable portion are rendered undependable because of its inaccessibility by the ordinary methods, and because the rather rapidly recurrent physiologic movements of this portion of the tube

tend to prevent the formation of adhesions. The bony portion with its noncollapsible walls is difficult to close because the injection of air through it from the movable portion, at rapidly recurring intervals, tends to prevent the formation of adhesions. Thus is explained the uncertainty of results following the introduction of irritants and curettage, on which methods surgical closure has heretofore depended.

It would seem, then, that if a method could be devised by which the tube could be at least temporarily closed and the caval end sealed over by a flap of tissue having periosteum on the side coapting with the bony surface and on the caval surface epithelium, which flap is held firmly and immovably in position, we might hope that closure of the tube could be obtained with far greater certainty than is secured by the methods employed up to the present time. A sine qua non for the success of the procedure is that a means be provided by which the flap of tissue intended for the tubal closure shall be held immovable and with proper firmness in position. Packing cannot be depended on to accomplish this, as the unavoidable movements imparted to the flap during the process of redressing will inevitably cause its displacement and thus cause failure of adhesion.

A technic is presented with the belief that by its use the hope expressed in the foregoing paragraph may be realized. The number of cases in which this method has been employed is too small and the elapsed time too short to warrant broad conclusions being drawn. It may be said that the results at present are highly satisfactory. No increased danger is added to the operation, and only a small increment of time to the performance of it. The publication of this method by myself is hastened by the fact that an article by a German writer has just appeared, which shows that he has been working along the same lines as I have. However, he missed the most important factor in the technic; namely, the securing of the flap firmly and immovably in position.

TECHNIC

The usual postauricular curved incision is made about 1 cm. from the attachment of the auricle. The incision should not be farther than this from the auricular fold, as will develop later. It is slightly curved forward above to the attachment of the temporalis. Below, the attachment of the sternocleidomastoid is severed with curved scissors, and care is exercised on elevating the periosteum that it is preserved intact. The usual radical mastoid operation is now performed. The posterior wall of the osseous canal is removed to a level with the inferior wall until only a small residuum covering the facial nerve remains. It is important to do this, not only because it insures the better coaptation of the inferior flap, but also because it prevents undesirable adhesions between the flap secured from the posterior auricular region, which will be described later.

After thoroughly removing the external wall of the epitympanic space and the external minute projections about the caval end of the eustachian tube, we proceed to remove the contents of the cavum. After the malleus and the incus have been accounted for, we carefully but thoroughly curet out the granulation tissue and mucosa. Particular attention is directed to the floor of the cavum, where the mucosa is especially thick and persistent. Trabeculae of bone are broken down until the floor presents a smooth, denuded surface. Special caution is necessary when we are using the curet in the region of the oval and round windows, but all accessible mucosa must be removed. The wound is now flooded and reflooded with hydrogen peroxid, after the eustachian tube has been plugged with cotton. The foaming peroxid is removed by washing with 10 per cent. aqueous solution of sodium bicarbonate. This procedure demarcates black bone, which is then removed. All sharp angles are rounded and leveled, and we are ready to deal with the tube.

An eustachian catheter is introduced through the nose into the pharyngeal opening of the tube. Through this a bougie is passed until it emerges into the cavum. We then proceed thoroughly to curet the bony portion of the tube. Tubal cells are broken down. The mucoperiosteum is forced backward into the lumen of the tube rather than scraped out from within outward. If this part of the operation were done before introducing the bougie, the inverted mucosa might prevent its passage. It is important that all mucosa and periosteum be removed from the tube and its surroundings. The end of a strand of No. 2 catgut is now tied to the end of the bougie projecting into the cavum, by means of very fine silk. That is, a double loop of silk is thrown around the end of the kangaroo tendon and another back of the bulbous point of the bougie, allowing an inch to intervene. The catgut and bougie are not spliced together. The bougie and catgut are then withdrawn through the catheter, and the catheter is removed. The end of the catgut which is tied to the bougie is then cut off. A thick composite knot is then tied in the catgut about 20 inches from the end which projects from the nose. The knot is then drawn into the tube. If it slips through the isthmus, the catgut is withdrawn through the nose and the size of the knot increased by knotting one or more strands over the original knot. It is again drawn into the tube. When it is firmly wedged in the isthmus, the strand is withdrawn through the nose and cut off within a centimeter of the knot. Again the knot is drawn into the tube, until it is firmly anchored in the isthmus. It is presumed that this inverts the lining of the tube so that denuded surfaces are brought into contact and held there.

We now proceed to the securing of the flap from the tissues covering the exterior of the mastoid to stitch over the caval end of the tube. The distance from the upper extremity of the external incision to the caval end of the tube will correspond with the length of the primary mastoid incision. If not, the incision may be prolonged downward. A second incision is now made parallel with the original mastoid incision, and separated from its posterior lip by 1 cm. If there is very densely intimate insertion of the muscle in the bone, it may be well to use the chisel to remove a very thin slice of bone with the lower end of the flap, a fact to be borne in mind when first removing the cortex if the mastoid cavity promises to be very large. The incision is carried upward to a point corresponding to the upper extremity of the original incision. It includes the periosteum, which is elevated and becomes an integral part of the flap. It is then cut free in a rounded manner from its lower extremity, and hangs from the upper pedicle, from which it derives its nourishment.

The strand of catgut issuing from the caval end of the tube is now threaded through a curved needle, which is passed through the lower portion of the external flap, at a place which, when it is drawn down along the strand of catgut into the cavum, causes it to coapt nicely over the tubal opening. To keep this in position, a perforated B. B. shot, held in artery forceps, is run along the catgut, and when it is rather tightly in contact with the flap covering the tubal opening, it is forcibly compressed. If one is dexterous enough, one may tie a knot close to the flap. It is unnecessary, perhaps, to say that there should not be the slightest tension on the flap when secured in this position. The flap will now occupy the upper portion of the mastoid wound and cavum, covering, it may be, the oval window. It may readily be seen that although the chief purpose of this flap is to cover the opening of the eustachian tube, it serves also as a considerable element in supplying epidermis for the entire upper portion of the cavity.

We now proceed to make our flap from the movable portion of the external auditory canal. One large flap to cover the floor is best. The flap from the exterior of the mastoid occupies the upper portion of the cavity. Therefore, the incision through the tissues of the movable canal must be well forward through the superior plane so that the posterior surface of the anterior remnant fits well with the anterior edge of the tongue flap. This incision begins at the detached

end of the canal, and is continued outward to the rim of the concha. Another incision at right angles to this is carried downward to the floor following the conchal ridge, but just inside it. This flap is held in place by a suture passed through it and into the external periosteum. The external auditory canal is then lightly packed, the posterior cavity is packed from behind, and the end of the packing is carried out of the lower angle of the external wound, which is then closed with stitches. The skin covering the upper portion of the tongue flap may be incised so that the posterior incision may be closed over it, or this may be done at a later period.

The after-treatment is very important in securing the success of the operation, and may well be the subject of a special communication later. Suffice it to say that recently I have been removing all packing twenty-four hours after the operation. A large, short glass tube is then introduced into the external auditory meatus, and a small rubber tube into the lower end of the mastoid wound, and the Carrel-Dakin method carried on. For the purpose of locating the shot, I have had attached to it a small ring, to which is tied a strand of silk; or the end of the catgut passing through the shot may be allowed to project into the external auditory canal from 3 to 5 cm. In any case it is removed within ten days.

COMMENT

The technic as described above may appear difficult and complicated, but it will be found simple and easy by any one who is properly trained in the anatomy and surgery of the parts involved.

22 East Washington Street.

TREATMENT OF ABDOMINAL PAIN DUE TO URETERAL OBSTRUCTION *

A. J. CROWELL, M.D.
CHARLOTTE, N. C.

Pain due to ureteral obstruction and pain produced by intra-abdominal conditions are often confused with each other. To differentiate between them frequently requires the most painstaking investigation, and presupposes a comprehensive knowledge of the exact mechanism of ureteral obstruction as well as a familiarity with those intraperitoneal conditions which produce pains simulating those caused by ureteral obstruction.

I realize the occasional difficulty of properly interpreting the clinical symptoms and physical findings in a given case, but by means of the cystoscope, roentgen ray and a well equipped laboratory, the nature of the majority of such conditions can be ascertained very definitely. The presence of pus in the urine may not signify serious trouble, since it may have its origin in the genitalia or urethra, yet grave conditions, such as tuberculosis of the kidney, pyelonephritis, ureter or kidney stone, may exist with comparatively few pus cells in the urine. The same is true of hematuria. A few blood cells in the urine may mean slight bladder congestion or injury, or they may signify nephritis; ureteritis; pelvic papilloma; bladder, ureter or nephritic stone; kidney tuberculosis; hypernephroma, or hypertrophy of the prostate gland.

Many patients have had the appendix removed, gallbladder drained, uterus suspended, and one or both ovaries removed without relief, when a careful urologic examination would have shown the presence of ureteral stone, ureteral stricture or kink, stone in the kidney, movable kidney, pyelitis, pyelonephritis, hydronephrosis or hydropyonephrosis. Hydronephrosis is the result of ureteral obstruction and is accompanied with bladder symptoms and abdominal pain. Movable kidney and kinked ureter are intimately associated. The pain due to ureteral obstruction is largely the result of back pressure, and such obstruction is frequently the predisposing cause of nephritic infection. Any condition which restricts the kidney pelvis from emptying itself completely will produce abdominal pain and, if not relieved, kidney destruction will result. The most frequent causes of ureteral obstruction are: ureteral stone, pressure from tumor, pregnant uterus, kinked ureter, ureteral stricture, bladder wall hypertrophy, and residual urine due to hypertrophy of the prostate gland or lesions of the central nervous system.

Recently two cases came under our care for treatment, each giving a definite history of severe and frequent attacks of kidney colic. Investigation revealed large saccular dilatations of the ureter just above the bladder wall in each case. In one case there were on the right side two normal pelves and one normal ureter, while the other ureter showed a large saccular dilatation about 2 inches (5 cm.) long just above the bladder wall. This contained ten ureteral stones, one of which was very large. In the other case, the dilatation was not so large and contained no stones, but was accompanied with far greater clinical symptoms. In the one case, the stones were removed by ureteral anesthesia and ureteral dilatation, and the symptoms disappeared. The second patient was cured by operation. In the latter case, we were at first persuaded that there was a stricture, but the ureteropyelogram cleared up the diagnosis. Such sacculations will certainly cause a pull on the withdrawal of a bulb. Many cases of abdominal pain are produced by ureteral dilatation from thickened or hypertrophied bladder walls. Such conditions may be brought about by chronic bladder irritation or infection, hypertrophy of the prostate gland or urethral stricture. Certain lesions of the central nervous system will cause partial bladder paralysis resulting in chronic retention or residual urine, and this, in turn, causes ureteral dilatation and abdominal pain by back pressure from the residual urine. We have such a case in a woman, aged 18, under our care at present.

Muscular spasm and its location is of great clinical significance. It is practically always present over the site of trouble, whether inflammatory or noninflammatory, and its presence is more important than pain. The pain elicited by deep percussion over the kidney, as well as that caused by pressure over the descending and transverse colon, is very significant in differentiating between appendicitis and right ureteral stone.

All patients having abdominal pain should be roentgenographed, and most of them should have the ureters catheterized before operation. Roentgenography alone will not differentiate between kidney and intraperitoneal lesions, but it may be the means of locating a renal or ureteral calculus. Gallstones may be detected in this way, but these should be differentiated from nephritic stone, as well as intra-ureteral and extra-ureteral shadows, by ureteral catheterization, pyelograms and ureteropyelograms.

There is seldom any difficulty in differentiating between acute intraperitoneal infections and those of the kidney. The fever in acute kidney infections is much higher than it is in intraperitoneal infections. The pulse and temperature are out of proportion in

* From the Crowell Clinic of Urology and Dermatology.
* Read before the Section on Urology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

the two conditions in that, in the acute kidney infections, chills with a temperature ranging from 103 to 104 F. with a pulse of from 85 to 100, are of frequent occurrence; but with such elevation of temperature in intraperitoneal infections, the pulse rate is much more rapid. The leukocyte count is not so high in kidney infections, without ureteral obstruction, and does not fluctuate so readily as it does in intraperitoneal infections. The low leukocyte count in the gangrenous appendix is the exception to this rule. The leukocyte count seldom, if ever, rises higher than from 16,000 to 18,000 in acute kidney infections, unless complicated with perinephritis, when it runs extremely high. Nausea and vomiting are far less frequent in acute kidney infections, without complete ureteral obstruction, than in the intraperitoneal infections. They almost invariably occur in the latter and occasionally in the former. Especially is this true in the beginning of the infection.

The coincidence of gallstone and renal infection is an occasional occurrence. Hematuria and pain in the right hypochondriac region, with a roentgen-ray shadow on that side, do not mean that the blood is coming from the right kidney. The shadow may be in the gallbladder when the blood is coming from the left kidney or the urinary bladder.

An acutely inflamed appendix or a tubo-ovarian inflammation may cause pyuria. No one is warranted in exploring the abdominal cavity for either of these conditions without first having ascertained the source of the pus. A brief report of a case will illustrate the value of this precaution:

Mrs. A, aged 19, with negative family history and no previous severe illness, complained of a severe pain in the right side which began two weeks before. On inspection the patient appeared undersized and rather poorly nourished. The abdomen was distended and very tender to touch. Her expression was that of a very sick woman in great pain. The temperature was 101, pulse 90, leukocyte count 15,500, red blood corpuscles 3,500,000 and hemoglobin 75 per cent. The tongue was dry, and the patient was distinctly toxic. She was having irregular chills and profuse sweats. A large mass was felt on the right side, but it was impossible to ascertain whether or not it was kidney, on account of a pregnancy of about six months' duration and tenderness in the region of the mass. Roentgenography was negative for stone. The bladder urine showed pus cells and a trace of albumin. This was the key to the real condition. Ureteral catheters were passed; we noted a very large hydropyonephrosis on the right side and a normal urine coming from the left kidney. The tumor mass disappeared, the diagnosis was cleared up, and the patient was spared an operation for appendicitis, which might have been disastrous. The predisposing cause of infection in this case was due to pressure from a pregnant uterus.

The importance of properly interpreting data obtained by ureteral catheterization and roentgenography is evident. Obstruction to the passage of a ureteral catheter may signify ureteral stone, ureteral kink and, occasionally, ureteral stricture. Ureteral stricture is, comparatively speaking, infrequent and, when it does occur, it is usually associated with tuberculosis of the bladder or kidney. While recognizing the wonderful contributions that Dr. Hunner has made to surgery, I am obliged to differ from him in his ideas of ureteral stricture and in his plan of diagnosing it. I have seen him exhibit some beautiful pictures of waxed catheters with complete circular indentations which, he stated, had been produced by ureteral stricture. The pictures were good, but his interpretation of the cause of the indentations was erroneous. No one ever saw a fibrous stricture open to allow an instrument to pass in and clamp down sufficiently to produce such indentations and then allow removal of the instrument without even making other marks in the wax. Fibrous tissue does not so contract and relax. Muscular contraction or spasmodic stricture may cause such indentations.

The lumen of a normal ureter is greatly changed by its regular, rhythmic contractions from above downward. We have ureteropyelograms showing ureteral narrowings at times and, at other examinations, these are seen to have entirely disappeared. The movement of a foreign body in the ureter, such as a bougie, will produce muscular spasm and cause a pull in almost any ureter, and may be misleading. No one method or attempt to diagnose ureteral conditions is sufficient. If we are to be accurate, repetition of effort and combination of methods are necessary.

Ureteral kink is probably one of the most frequent causes of abdominal pain. Any chronic, nontuberculous infection of the kidney pelvis and ureter will cause both lengthening and dilatation of the ureter. The result is ureteral kink.

In tuberculous infections, the lumen of the ureter is not enlarged, as a rule, but its walls are thickened. Other possible causes of ureteral kink are aberrant blood vessels, nephroptosis, and adhesions following abdominal operations.

The treatment of these conditions is obvious. When the pain is caused by ureteral stone, it is relieved by removal of the stone. I believe that practically all recently impacted ureteral stones can be removed by ureteral anesthesia and ureteral dilation. If for any reason this procedure is not practicable, the stones should be removed by ureterolithotomy.

Pelvic lavage, in cases of pyogenic infections, will prevent kink in the early stages of infection and, when kink occurs, lavage will be very beneficial in many cases. Kidney fixation, in cases of nephroptosis, is about the only procedure from which we may justly expect beneficial results. When the kink is due to aberrant blood vessels, they should be ligated and severed. Beneficial results may be obtained, when the symptoms are produced by adhesions, by breaking up the aberrant blood vessels and freeing the ureter. I believe that the ureteral catheter should be left in from twenty-four to forty-eight hours after any one of these operations.

I have seen beneficial results follow the use of the ureteral retention catheter in cases of ureteral kink due to infection. In a case of two right-angle kinks in one ureter, excellent results followed the use of the retention catheter for three days; I shall try it further when a suitable case presents itself. Best results may be expected from this plan of treatment when the infection has not been of long standing, and when the ureters are not greatly dilated.

ABSTRACT OF DISCUSSION

DR. BRANSFORD LEWIS, St. Louis: With reference to kink in the ureter and conditions of obscure diagnosis, I had one impressive case in a young woman, married only a few months, who had a persistent pain in the right kidney, with pus in the urine. The surgeon who was consulted took out a diseased kidney on that side (the right). Later, when the pain continued and the various symptoms of sepsis continued, the patient was sent to me, and I found an enormous amount of pus coming from the remaining kidney. We could not get

a catheter into the diseased side, but by injecting bromid and lifting the pelvis we took a picture which disclosed not only that the left ureter was dilated but also that it executed kinks and loops in its descent to the bladder. The sole remaining kidney was almost destroyed and had only that corrugated and tortuous ureter to drain it. All that could be done was to drain the kidney directly through the loin. To my mind, the mistake was in not pursuing the investigation in the first place by precise methods. These symptoms of pain, etc., are very misleading, but many of the general profession do not know that and place their reliance on them. With relation to the pyelitis of pregnancy, I have seen a case in which the temperature rose to 106 F., and life seemed to be definitely threatened, yet the chills, which were those of urinary sepsis, all disappeared after the introduction of the ureteral catheter and the retention of the catheter for from one to ten days. On the too early removal of the catheter, I have seen a return of the condition; but, on leaving the catheter for a longer time, I have seen it clear up again. Possibly a kink would also be relieved in that way. Another question that seems practical is whether roentgenography in the presence of pregnancy is a safe procedure—whether it endangers the life of the child. I have seen no indications that it is dangerous, but, if it is, I think that some one should state the facts.

DR. A. B. CECIL, Los Angeles: I became interested in abdominal pain in diseases of the kidney and ureter when pyeloroentgenography was first used. At that time, in Baltimore, we observed many people who had had operations on the gallbladder and appendix whose real trouble proved to be, in many instances, hydronephrosis. About three years ago, in reviewing 300 cases in which a complete urologic investigation had been carried out, I noted that abdominal pain was very common in diseases of the kidney and ureter, and that frequently this pain occurred in the region of the gallbladder or appendix. In 28 per cent. of the cases of stone in the kidney and ureter, surgical attacks had been made on the gallbladder or appendix without relief of pain, and in hydronephrosis a higher percentage of operations on these organs was observed. It is recognized, however, that one would much better err on the side of safety in questionable pain which might be due to the appendix. In regard to differentiating intra-abdominal diseases from diseases of the kidney and ureter, I do not believe that one can tell from the localization of the pain, from fever, from the blood picture, or from the clinical picture in general, whether he has to deal with an acutely inflamed appendix or an acute infection of the kidney. In some instances I have thought that the respiratory wave had some significance. In acute infections of the kidney, as a rule, the respiratory wave sweeps over the abdomen, while in appendicitis it is limited. In acute infections of the kidney, however, there undoubtedly is in many instances a certain degree of muscle spasm over the lower abdomen.

DR. ARTHUR L. CHUTE, Boston: I wish to express a word of caution about being too fearful lest one mistake a ureteral stone for an appendicitis and remove a normal appendix. This is undesirable, but it does not compare with the tragedy of mistaking an acutely inflamed appendix for a ureteral stone. I have seen two cases in the last few years in which, on account of what was supposed to be blood in the urine, this mistake was made with a fatal outcome. These were perfectly clear appendicitis cases, but the presence of blood cells had led these men to suspect a ureteral stone and to postpone operation until it was useless. If after careful, but not too prolonged, study one is not sure whether he has to deal with a ureteral stone or an acute appendicitis, one had better have some one take out an appendix that proves to be normal than to wait and find that one has something one cannot control.

DR. JOSEPH H. SMITH, Memphis, Tenn.: The general and abdominal surgeon should know more about urology than he does, and the urologist should know more about general surgery. I believe the abdominal surgeon is too prone to do an abdominal section on vague symptoms. The urologist, when there is abdominal pain and he suspects stone in ureter or kidney, is in a position, by his knowledge of cystoscopic technic, to verify his diagnosis. The abdominal surgeon is in the dark unless he can rely on a competent urologist to verify his suspicions. Recently a woman was referred to me because of abdominal pain in the lower right quadrant. She was very large, weighing about 185 pounds (84 kg.), and an examination was difficult. The surgeon at one time obtained a history of hematuria, and the patient said she thought she passed a stone. Hematuria in women does not mean anything after 45. The surgeon suspected a stone in the ureter or the kidney. She was put through the usual cystoscopic tests, and the examinations from kidneys were negative. I told the surgeon that examination of the kidneys was negative, and that the patient evidently had some pathologic condition in the abdomen. The history indicated that she had had an abdominal operation four years before, with removal of the tubes and ovaries and, supposedly, the appendix. I advised that he get the history of that operation and see whether there was any pathologic condition that could be causing the trouble. It was not my place to make a digital examination to determine whether she had some abdominal pathologic condition. He examined the patient completely again and then asked me to repeat my examination. I did so and found nothing. The patient was still suffering and was getting impatient on account of colicky pains in the lower right quadrant, so I advised exploratory laparotomy. Omental adhesions in the retrocecal region were found to be the cause of the trouble. This shows the importance of knowing something about abdominal pains outside one's own particular specialty.

DR. EDWARD L. YOUNG, JR., Boston: I do not believe that an uncomplicated appendicitis ever is accompanied by a temperature of 103 F. or more. I have been watching this for a number of years and have yet to see such a case. In the presence of such a temperature, there is either something else or a ruptured appendix. It is better to remove a good appendix than to leave a bad one in case one is not sure of the diagnosis. As to the question of pus in the urine from pyelitis, I do not believe that a colon bacillus infection can exist in the pelvis without pus. A colon bacillus infection, starting as a septicemia, may later localize in the pelvis and may be seen without pus in the early stages.

DR. HERMON C. BUMPUS, JR., Rochester, Minn.: We make frequent use of the overdistention test in our routine cystoscopic examinations. If the pain produced by distending the renal pelvis is different from the patient's original complaint we feel confident that the origin is extrarenal. If the distention causes pain identical with that first complained of, a pyelogram is indicated and the physician should hesitate to diagnose the disease as of renal origin. A pyelogram often reveals a normal kidney in these cases.

DR. A. J. CROWELL, Charlotte, N. C.: The object of this paper was to emphasize the importance of a careful investigation of all cases of abdominal pain, and discourage the use of any one method to arrive at a diagnosis. With regard to temperature and leukocyte count associated with abdominal pain, as a rule, the leukocyte count is higher in intraperitoneal infections than in kidney infections, but there are exceptions, as mentioned in the paper. No hard-and-fast rules can be laid down with regard to these cases.

Treatment of Enuresis in Children.—Zuber has noted that the urine of children subject to enuresis is alkaline or hypoacid. By giving a drug to render the urine frankly acid, the incontinence subsided. The *Bulletins de la Société de pédiatrie de Paris* **20**:193, 1922, contain his report of ten cases cured last winter by this means. When the urine gives an alkaline reaction, he orders from one to four teaspoonfuls to be taken before meals of the Joulie solution of phosphoric acid. This is a mixture of 17 gm. of official phosphoric acid; 34 gm. sodium phosphate, and 250 gm. distilled water. Whenever the urine reaction veered to acid, a cure was usually realized. He assumes that the reflex which closes the bladder sphincter requires an acid stimulus for it to occur.

PRODUCTION OF ARTERIOSCLEROSIS IN RABBITS BY DIETS RICH IN ANIMAL PROTEINS*

L. H. NEWBURGH, M.D.
AND
SARAH CLARKSON, M.S.
ANN ARBOR, MICH.

In a note published two years ago, Newburgh and Squier [1] reported the occurrence of atherosclerosis in two small groups of rabbits, eleven in all, that had been fed high protein diets. While the evidence at hand indicated that the vascular lesion had been caused by the diets, such a conclusion was not safe because the experiments were too few to permit a generalization.

The present communication is an abstract [2] of the further investigation of the effect of high protein diets on the arteries of rabbits.

The term atherosclerosis, as used by most pathologists, is intended to designate a primary disease of the intima and to exclude lesions of the intima which result from disease of the media or vasa vasorum. The gross and histologic characteristics of this primary intimal disease are so well known to this group that further description is unnecessary.

Two series of animals have been fed the experimental diets. The first series received food containing 36 per cent. of protein, and the second series ate a diet containing 27 per cent. of protein. The diet yielding 36 per cent. of protein was made by mixing together equal parts by weight of dried, powdered lean beef (81 per cent. protein), wheat flour and bran, to which was added 1 per cent. of sodium chlorid and 5 per cent. of "baking powder," and enough water to make a stiff dough. The mass was baked in a hot oven for about one hour. The mixture containing 27 per cent. of protein was prepared in the same way except that one part of the powdered beef was mixed with two parts each of flour and bran.

In addition to this food, the rabbits were given about 100 gm. of greens one or twice a week.

Rabbits that had been raised outdoors under excellent conditions were selected. They were housed during the experiment singly or in small groups in unheated pens protected from rain and wind.

Fig. 1.—Aorta of rabbit given a diet containing 27 per cent. of protein for nine months; note the irregular plaques and streaks; the normal intima of the arch is entirely replaced by a broad confluent plaque.

Twenty-four animals lived for four weeks or more on a diet containing 36 per cent. of protein. These twenty-four animals may be conveniently divided into three groups determined by the duration of the experiment. In the first group are ten animals that lived from four to eight weeks on the diet. Two of these showed very early intimal disease. Six rabbits lived on the diet from ten to sixteen weeks, and four of them showed early intimal disease. The remaining eight rabbits ate the high protein mixture from eighteen to thirty-six weeks, and all of them showed marked and extensive atherosclerosis.

Fifty-one animals were fed the diet containing 27 per cent. of protein. These rabbits fall naturally into two groups: forty that lived less than twenty-six weeks, and eleven that lived from twenty-six to fifty-nine weeks. None of the forty rabbits that lived for less than six months on the diet containing 27 per cent. of protein showed atherosclerosis of the aorta; whereas, eight of the eleven animals that lived on this diet for more than six months presented aortic lesions which were grossly and histologically typical of true atherosclerosis. The vascular lesions in seven of these eight rabbits were advanced and extensive. The eighth rabbit that had eaten the diet for just six months showed an early but widely distributed process.

Fig. 2.—Normal aorta: *A*, the narrow intima; *B*, broad muscular media; *C*, adventitia.

From this summary of results it is evident, first, that animals which ate a diet containing 36 per cent. of protein showed the atherosclerosis sooner than the rabbits that received only 27 per cent. of protein; and, secondly, that the occurrence and extent of the atherosclerosis is roughly proportional to the duration of the feeding.

These facts strongly suggest that the vascular lesions were produced by the diet; but before being certain that such is the case, it is necessary for us to investigate two sources of error. It is not inconceivable that rabbits which are confined in laboratories for many weeks or months may be exposed to some conditions which in themselves are capable of causing atherosclerosis. In order to answer this question, nineteen rabbits were set aside in a large pen and were cared for as ordinary stock animals, except that, when one of these nineteen rabbits came down with an infection, he was not removed but was, on the contrary, allowed to remain with his fellows until he eventually died. This was done in order to accentuate the unfavorable conditions of the laboratory and thus make the control more rigid. Twelve of these animals lived more than

* From the Department of Internal Medicine, University of Michigan Medical School.
* Read before the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.
1. Newburgh, L. H., and Squier, T. L.: High Protein Diets and Arteriosclerosis in Rabbits, Arch. Int. Med. **26**:38 (July) 1920.
2. A complete report of these studies will shortly be published.

six months. Not a single example of atherosclerosis was found in these nineteen rabbits. Hence the vascular lesions seen in the animals that ate the high protein diets were not an outcome of mere residence in the laboratory.

A second possible source of error is in the question of how often spontaneous atherosclerosis occurs in rabbits. We have examined the aortas of 116 supposedly normal rabbits. Four of them or 3.5 per cent., showed small, wartlike lesions of the upper aorta. Steinbiss [3] found no arterial lesions in 500 normal rabbits, and Loeb [4] found only normal aortas in 483 control rabbits examined by him. Spontaneous vascular disease, accordingly, is a negligible source of error in our experiments.

Since neither the conditions prevailing in our laboratory nor the spontaneous occurrence of aortic lesions will account for the atherosclerosis in our experimental animals, we feel justified in asserting that this atherosclerosis was caused by the diet.

This lesion, as seen by the unaided eye, is made up of discrete and confluent, raised, opaque, white streaks and plaques. The process is always most marked in the upper thoracic aorta and, in early cases, may be limited to a few closely set, tiny plaques restricted to the arch. As the process becomes older and more marked, the individual lesions become larger and extend farther down the aorta. In advanced examples, one of which is shown in Figure 1, the plaques and streaks are thickly distributed along the whole aorta, and may even extend a few centimeters into the great vessels given off by the aorta. In the upper aorta, the fusion of the plaques often results in the entire disappearance of normal intima. Not infrequently, the lesion extends into the aortic valves, causing them to become thick and stiff. In a few instances, the mitral valve was similarly involved.

Fig. 3.—Aorta of rabbit in which atherosclerosis was moderately advanced; a diet containing 27 per cent. of protein was fed for nine months. *A*, great thickening of intima brought about by the large vacuolated cells and a hyperplastic elastic tissue; fat stains demonstrate that the vacuoles are filled with fat; *B*, normal media; *C*, adventitia.

The lesion, when examined with the microscope, is clearly a primary disease of the intima. It begins with a necrosis or fatty degeneration of the endothelial cells. The initial injury is very quickly followed by great thickening of the intima, owing to the presence in it of large cells loaded with fat and embedded in a hyperplastic elastic tissue (Fig. 3). At a somewhat later stage, when repair is being attempted, the picture will have added to it a broad band of fibrous tissue on the lumen side of the lesion (Fig. 4). Below this is the area of degeneration, which may have by now

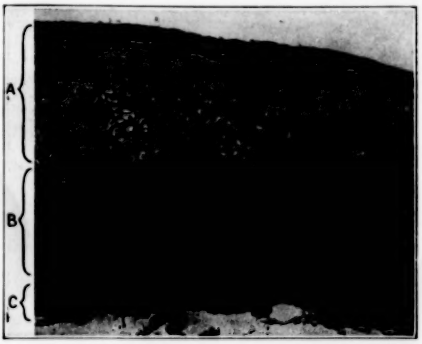


Fig. 4.—Aorta of rabbit in which atherosclerosis was far advanced; a diet containing 27 per cent. of protein was fed for eleven months. *A*, intima, showing a band of dense fibrous tissue on the lumen side of the vessel below this are; degenerated, fat-containing cells; *B*, the degeneration has progressed far into the media; *C*, adventitia. Other sections of this aorta show masses of calcium scattered irregularly through the area of degeneration.

invaded the media to a variable degree and which will still show enormous amounts of fat.

Investigators have from time to time claimed to have discovered an etiologic agent of human atherosclerosis, on the ground that this agent had caused vascular injury in rabbits. Before such claims should be given any weight, their supporters should demonstrate that the experimental arterial lesion bears at least a very close resemblance to the disease in the human being.

More often than not, the vascular lesions obtained by students in this field have failed to suggest human atherosclerosis. Among the relatively few successful investigations, the work of Ignatowski [5] is of great importance. In summing up his results, he pointed out that all rabbits that were fed animal protein showed primary intimal disease of the aorta. The accompanying description of the lesion, although far from complete, was nevertheless sufficient to indicate that it bore a strong resemblance to human atherosclerosis. This work was soon followed by a number of investigations directed toward an analysis of the chemical mechanism which is responsible for the deleterious effect of animal diets on the arteries of rabbits.

Both the gross and the histologic pictures seen in the experimental aortic lesions resulting from our high protein diets, are so similar to corresponding stages of human atherosclerosis as to leave no doubt that the human type of primary intimal disease has been produced.

In spite of the close resemblance between our experimental atherosclerosis and the disease as it occurs in

3. Steinbiss: Arch. f. path. Anat. **212**: 152, 1913.
4. Loeb: Deutsch. med. Wchnschr. **39**: 1819, 1913.
5. Ignatowski: The Action of Animal Protein upon the Aorta and Parenchymatous Organs of Rabbits, Arch. f. path. Anat. **198**: 248, 1909.

man, it is not claimed that the abuse of protein causes human atherosclerosis. The available experimental facts do not permit a final answer to this question. The vascular system of omnivorous man may have acquired an insusceptibility to the products of protein metabolism, not possessed by the herbivorous rabbit. It may, on the other hand, be true that the arteries of man are as easily injured by the derivatives of protein as are those of the rabbit; or, finally, that man has acquired only a partial immunity which may be broken down by years of a protein intake two or three times greater than is needed to maintain health.

SUMMARY

Spontaneous atherosclerosis is a very rare disease in rabbits. Diets containing 27 and 36 per cent. of protein derived chiefly from beef have produced true atherosclerosis in the rabbit. The time of appearance and the extent of the lesion were roughly proportional to the amount of protein in the diet and the duration of the feeding.

ABSTRACT OF DISCUSSION

DR. M. W. LYON, JR., South Bend, Ind.: I am glad that Dr. Newburgh was uncertain whether the lesion in rabbits could be exactly comparable to similar lesions in human beings on account of the zoologic difference between the subjects. I think anatomic and zoological investigations in human beings would establish the fact that men have had a rather high protein diet for many generations and have become accustomed to it; whereas, the rabbit is one of the most strictly herbivorous mammals known. It is even more strictly herbivorous than many of the true rodents. The real origin of rabbits is probably from some preungulate ancestor. It seems to me that it might be advisable to try the experiments on an animal which has a diet much more like that of human beings than the rabbit, such as the ordinary hog. The hog has probably been eating a protein diet for a long time. I think there are few hogs in the wild or the domestic state that will not eat much protein if they can get it. I doubt that we should conclude that we can produce arteriosclerosis in ourselves by a protein rich diet, despite these experiments which have been performed so carefully. I do not doubt that Dr. Newburgh does produce it in rabbits, but I think we should be cautious in applying his observation to man.

DR. L. H. NEWBURGH, Ann Arbor, Mich.: Dr. Fox of Philadelphia has examined all of the animals that have died in the Philadelphia Zoological Garden. His conclusions are of interest in this connection. He pointed out that the carnivora had chronic vascular and renal lesions, and that they were practically the only ones that had such lesions. I wrote to Dr. Fox, asking him whether I was justified in assuming that a definite relationship existed between the carnivorous diets and these chronic lesions of the arteries and kidneys. In his reply, he stated that this certainly was true, that the meat-eating animals showed a high incidence of chronic disease of the arteries and the kidneys as compared with all the other animals on which he had performed necropsies.

Injuries to the Patella.—The patella alone is rarely the seat of a chronic sinus. Splintering or perforation of the bone is rapidly followed by healing, if the joint has not been seriously affected. When joint complications occur, the bone is as a rule removed early. A missile, after perforating the patella, may injure the opposite limb. In one such case early in 1918, after removal of the right patella, I performed arthrotomy on the left knee, removing a missile that had been lodged in the joint after traversing the right patella.—Bizarro, A. H.: *Chronic Traumatic Periosteomyelitis of Femur and Tibia Near Knee*, Lisbon: National Printing Office, 1922.

CLINICAL STUDIES OF QUINIDIN

IV. THE CLINICAL TOXICOLOGY OF QUINIDIN *

ROBERT L. LEVY, M.D.

NEW YORK

In the treatment of certain of the cardiac irregularities, particularly auricular fibrillation, quinidin sulphate is, at times, a useful agent in altering the cardiac mechanism.[1] A number of untoward effects have been noted in patients receiving this drug, and several fatalities have been ascribed to its use. It is of interest to inquire as to what has been the clinical experience with this alkaloid in the past, and it is important properly to evaluate the significance of the accidents that have more recently followed its administration.

HISTORICAL

The alkaloid quinidin was first isolated by van Heijningen [2] in 1849 from a substance called chinoidin, a by-product in the preparation of quinin. He described it under the name "beta-chinin."

In 1853, Pasteur [3] prepared the same drug, perhaps in somewhat purer form, and named it "chinidin." Hesse,[4] in 1868, in referring to it, called it "conchinin"; other less used designations are "cinchotin" (Hlasiwetz), and "beta-chinidin" (Kerner). The sulphate is the form that has commonly been employed for therapeutic purposes.

In his original communication, van Heijningen makes casual mention of the fact that Bauduin, a Dutch clinician, found "beta-chinin" just as effective in the treatment of malaria as quinin. The first to make extensive use of quinidin in the clinic was Wunderlich,[5] who gave it to patients with malaria. In the second edition of his Handbuch he says:

> I have tried out the neutral sulphate of quinidin in more than 100 cases and have found it to be a preparation fully as efficacious as quinin, and at the present time give it almost exclusively in hospital practice because it is cheaper. In mild cases, 10 grains suffice; in more severe infections one may use 15 to 25 grains, seldom more, just as with quinin.

Why later Wunderlich abandoned the use of the drug is not clear. In the Leipzig clinic it was again extensively employed by Strümpell,[6] who reported on its antipyretic action in fifty cases of infectious disease—malaria, typhoid, pneumonia, erysipelas, puerperal fever and pulmonary phthisis. The largest individual dose given was 1.5 gm. In typhoid fever, in addition to lowering of the temperature, there was observed slowing of the pulse, vomiting (occurring from one-quarter hour to three hours after taking), tinnitus aurium, sweating, faintness and, in one instance, collapse and death. This was in a woman

* From the Hospital of the Rockefeller Institute for Medical Research, New York.

1. Levy, R. L.: Clinical Studies of Quinidin, I, Restoration of the Normal Cardiac Mechanism in Auricular Fibrillation by Quinidin, J. A. M. A. **76**: 1289 (May 7) 1921; II, Alterations in the Cardiac Mechanism After Administration of Quinidin to Patients with Auricular Fibrillation, with Consideration of Certain Toxic Effects of the Drug, Arch. Int. Med., to be published; III, Some Results of the Quinidin Treatment of Auricular Fibrillation, New York State J. M. **22**: 276 (June) 1922.

2. Van Heijningen, J.: Ueber Chinoidin und B-Chinin, Pharm. Centralbl. **20**: 465, 1849.

3. Pasteur, L.: Recherches sur les alcaloides des quinquinas, Compt. rend. Acad. d. sc. **36**: 26, 1853.

4. Hesse, O.: Ueber Conchinin, Ann. d. Chem. u. Pharm. **146**: 357, 1868.

5. Wunderlich, C. A.: Handbuch der Pathologie und Therapie, Ed. 2, Stuttgart, 1856, p. 512.

6. Strümpell, A.: Ueber die Anwendung und die antipyretische Wirkung des Conchinins, Berl. klin. Wchnschr. **15**: 679 (Nov. 18) 1878.

of 32, who had received quinidin with good antipyretic effect on several occasions, but who, by mistake, swallowed 4 gm. in 60 c.c. of water, the solution having been prepared for use as an enema. She vomited at once, and there were symptoms of collapse. Next day she had apparently recovered. Suddenly, however, and regarded as the cause of death. But he warns against large doses (from 3 to 5 gm.), such as were evidently being used in other clinics.

Two years after these cases were described, Freudenberger [7] recorded two sudden deaths in patients ill of typhoid, following the taking of comparatively

TABLE 1.—SYMPTOMS ATTENDING QUINIDIN ADMINISTRATION IN TWENTY FIVE CASES OF AURICULAR FIBRILLATION

Case No.	Age, Years	Etiology	Mitral Disease	Mitral and Aortic Disease	No Valve Lesion	Cardiac Enlargement	Quinidin Therapy: Total Amount, Gm.	Quinidin Therapy: Duration of Admin., Days	Quinidin Therapy: Result	Symptoms: Headache	Tinnitus Aurium	Giddiness	Palpitation	Dyspnea	Nausea or Vomiting	Epigastric Distress	Diarrhea	Fever	Precordial Pain	Mental Symptoms	Flushing	Sweating	Comment
Cases in Which the Normal Rhythm Was Restored																							
1	55	Syph.	..	..	+	+	4.6	6	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
2	26	Rheum.	+	..	..	++	1.6	2	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
3	49	Rheum.	+	..	..	++	8.4	7	+	..	..	..	+	+	+	..	..	..	..	..	..	..	Ventricular tachycardia induced; duration of normal rhythm only 14 days
12	32	Rheum.	+	..	..	+	0.4	1	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
14	39	Rheum.	+	..	..	+	2.0	2	+	..	..	+	+	..	..	..	..	..	..	..	..	..	
17	43	Syph.	..	..	+	+	3.2	3	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
18	33	?	..	..	+	+	1.2	1	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
21	58	Syph.	..	..	+	+	0.4	1	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
22	31	Rheum.	..	+	..	++	1.6	1	+	..	..	..	..	..	..	..	..	..	..	..	..	..	
24	45	Rheum.	+	..	..	++	6.8	6	+	+	..	..	..	..	..	+	..	..	..	..	..	..	Cerebral embolus 40 min. after onset of normal rhythm; died 2 weeks later with thrombosis of abdominal aorta
25	49	?	..	..	+	+++	3.2	3	+	+	..	+	+	..	+	..	..	..	+	..	+	..	Died suddenly 1 hour and 40 minutes after onset of normal rhythm
Cases in Which the Normal Rhythm Was Not Restored																							
4	32	Rheum.	..	+	..	++	4.8	5	0	+	..	..	+	..	..	..	..	..	..	..	..	..	Died 3 months later
5	19	Rheum.	..	+	..	+++	4.2	7	0	+	..	..	+	..	..	..	..	..	..	..	..	..	
6	23	Rheum.	+	..	..	+++	3.6	5	0	+	+	..	+	+	++	..	..	..	..	..	..	..	Ventricular tachycardia induced
7	58	Arterio-sclerosis	..	..	+	+++	3.2	5	0	+	..	..	+	..	+	..	..	..	..	..	..	..	Ventricular tachycardia induced
8	24	Rheum.	+	..	..	+++	6.2	8	0	+	..	..	+	..	+	+	+	..	..	..	..	+	
9	33	Rheum.	+	..	..	++	2.4	3	0	+	..	..	..	..	..	..	..	..	+	..	..	..	
10	46	Syph. & Rheum.	..	+	..	++	3.0	4	0	+	..	..	+	+	..	+	..	..	..	+	..	..	Died 4 mos. later; at necropsy there was a thrombus in the left auricle, thrombosis of the pulmonary arteries and pulmonary infarction
11	55	Arterio-sclerosis	..	..	+	+++	6.8	5	0	+	..	+	+	..	..	+	+	+	+	..	..	..	
13	23	Rheum.	..	+	..	+++	4.4	5	0	+	..	+	..	..	..	..	..	+	..	..	..	..	
15	37	Rheum.	..	..	+	++	8.4	10	0	+	..	..	..	..	+	+	+	..	..	..	+	..	
16	48	Rheum.	+	..	..	+++	3.6	3	0	+	..	..	+	..	+	..	..	..	..	..	..	..	Ventricular tachycardia induced
19	46	Rheum.	+	..	..	++	6.0	4	0	+	..	..	+	..	..	..	..	..	..	..	..	..	
20	30	Rheum.	..	+	..	++	7.6	5	0	+	..	..	..	..	..	..	..	..	..	..	..	..	
23	23	Rheum.	..	+	..	+++	1.6	2	0	..	..	+	+	..	++	..	..	..	..	..	..	..	Ventricular tachycardia induced

TABLE 2.—REPORTED CASES OF EMBOLISM AFTER QUINIDIN

Author and Publication	Embolism: Site	Embolism: Time After Establishment of Normal Rhythm	Embolism: Result	Comment
1. Benjamin and von Kapff: Deutsch. med. Wchnschr. **47**:10 (Jan. 6) 1921	Lung	12 hours	Death	
2. Sappington: J. A. M. A. **78**:59 (Jan. 7) 1922	Brain	24 hours	Death	
3. Frey and Hagemann: Ztschr. f. d. ges. exper. Med. **25**:290, 1921	Lung	2 hours	Recovery	
4. Ellis and Clark-Kennedy: Lancet **2**:894 (Oct. 29) 1921	Lung, kidney	24 hours	Recovery	
	Popliteal artery	.....	Recovery	Same case as above; embolism occurred before onset of normal rhythm
5. Ellis and Clark-Kennedy: Lancet **2**:894 (Oct. 29) 1921	Spleen	24 hours	Recovery	
6. Wilson and Herrmann: J. A. M. A. **78**:865 (March 25) 1922	Brain	8 hours	Recovery	Residual palsy
7. Carter, Dieuaide and Burwell: J. A. M. A. **78**:1921 (June 17) 1922	Kidneys	?	Death	Death from uremia
8. Carter, Dieuaide and Burwell: J. A. M. A. **78**:1921 (June 17) 1922	.....	?	Death	Details not given
9. Levy: New York State J. Med. **22**:226 (June) 1922	Brain	40 minutes	Recovery	Death 3 weeks later with thrombosis of abdominal aorta

without ascertainable cause, she became unconscious, and heart and respiration temporarily ceased. She revived, but died seven days later without regaining consciousness.

At necropsy, there were found numerous deep typhoid ulcers in the intestine, and several small hemorrhages on the inner surface of the dura mater. The findings were otherwise negative. It is doubtful, Strümpell concludes, whether quinidin may be small doses of quinidin. In one case, the severity of the disease may have been in large part responsible for the fatal issue. In both cases gastro-intestinal symptoms, i. e., nausea, vomiting and abdominal pain, were produced. He believed that death may have been due to violent vagus irritation and, reflexly, cessation of heart and respiration. As contraindications to

7. Freudenberger, J.: Ueber Conchinin und seine therapeutische Verwendung, Deutsch. Arch. f. klin. Med. **26**:577, 1880.

the use of the drug, he cites cardiac weakness or signs of irritability in the domain of the vagus, as evidenced by vomiting, signs of peritoneal irritation or severe gastric catarrh, such as occurs in chronic alcoholism.

Steffen,[8] in 1882, reported two deaths in children, both of whom were suffering from scarlet fever. A girl, aged 8½ years, received 1 gm. on the day of admission to the hospital, and two doses of 0.5 gm. each on the following day. One hour after the second dose, there were vomiting, collapse, convulsions and death in a few minutes. No necropsy was performed. The second patient, a girl, aged 4 years, received 9.5 gm. in seventeen days, usually not more than 1 gm. being given in a twenty-four period. One hour after the last dose, there were vomiting and convulsions, and thirty minutes later, death. Necropsy revealed inflammation of the pia mater, bronchitis and peribronchitis, inflammation and exudation in all the serous cavities, and inflammation of the kidneys. It is reasonable to question whether the last dose of the drug was entirely responsible for the fatal outcome in so sick a patient.

In the same communication is found a report of the occurrence of edema after quinidin. A boy, aged 7½ years, with typhoid fever, received 12 gm. of quinidin in five days. He vomited several times, usually from one-half to one hour after taking the drug. On the fifth day, edema of the face and lower legs appeared, and on the sixth day there was general anasarca, with diarrhea. On the seventh day, diuresis, with a urinary output of 3,000 c.c., began, and continued on the eighth day, on which there was an output of 2,700 c.c. The transudates coincidentally disappeared.

Next day, because of the recurrence of fever, 2.5 gm. of quinidin was given. Again general anasarca resulted, with diuresis and disappearance of the edema on cessation of therapy. There was no dilatation of the heart, says Steffen, but the pulse was irregular and feeble.

The foregoing account of certain clinical experiences with quinidin during the period in which it was extensively employed in cases of malaria and as an antipyretic in the acute infectious diseases serves to indicate that even at that time undesirable effects were attributed to its use.

UNTOWARD EFFECTS OF QUINIDIN IN AURICULAR FIBRILLATION

More than 460 cases of auricular fibrillation treated with quinidin have been reported during the last four years. Undoubtedly many more patients have received this drug. A variety of undesirable effects have been recorded; a number of accidents are, as I am well aware, not yet reported in the literature. The untoward effects may, for the purpose of discussion, be divided into six groups: (1) unpleasant symptoms attending administration; (2) induction of heart failure; (3) sudden collapse; (4) occurrence of heart rhythms indicating intoxication of the heart muscle; (5) embolism, and (6) sudden death.

1. *Unpleasant Symptoms.*—In our own experience, these have been relatively uncommon in the group of patients in whom normal rhythm was established (Table 1). The dose in these cases has ranged from 0.4 to 8.4 gm., given in from one to seven days. The average dose was 3 gm. given over a three day period, according to a plan previously outlined.[9] Two patients in this group who complained of discomfort are worthy of special mention. In both (Cases 3 and 24) the normal rhythm was of short duration, i. e., fourteen days and thirty-six hours, respectively. In Case 3, it was not possible on another occasion to restore the sinus rhythm. Case 24, discussed in more detail later, exhibited evidence of cerebral embolism. In short, these patients were unfavorable subjects for quinidin therapy.

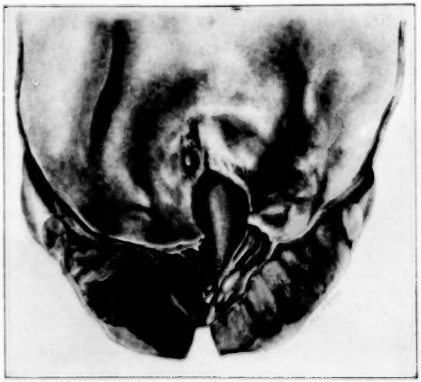


Fig. 1 (Case 24).—Drawing of the auricular aspect of the mitral valve.

In contrast to the paucity of complaints among this group, unpleasant symptoms were common in the cases in which it was not possible to restore the sinus rhythm. Headache and palpitation were the chief sources of discomfort. Next in frequency were nausea or vomiting, epigastric distress, giddiness, diarrhea, precordial pain, fever, tinnitus aurium, mental depression, excitement, flushing and sweating. Urticaria and scarlatiniform eruptions have also been observed, the latter notably by Ellis and Clark-Kennedy. Tachycardia was the rule. The dose ranged from 1.2 to 8.4 gm. given in from two to ten days. The average dose was 4.7 gm. given over a five day period. The average figures both for dose and for duration of administration are a little higher in this group and account perhaps in part, though certainly not entirely, for the discrepancy in the number of symptoms produced; for the complaints were usually made early in the course of therapy and, unless truly distressing, were disregarded in the hope that subsequently a change in cardiac mechanism might be produced.

2. *Induction of Heart Failure.*—In a previous communication,[10] attention was directed to the possibility of the occurrence of heart failure as a result of the acceleration of ventricular rate caused by quinidin, and an illustrative case was reported in some detail. Another instance has been recorded by Eyster and Fahr.[11] By careful clinical observation, such an occur-

8. Steffen, A.: Ueber Conchinin und Hydrochinon, Jahrb. f. Kinderh. **18**:71, 1882.

9. Levy, R. L. (Footnote 1, third reference).
10. Levy, R. L. (Footnote 1, second reference).
11. Eyster, J. A. E., and Fahr, G.: Observations on the Use of Quinidin in Auricular Fibrillation, Arch. Int. Med. **29**:59 (Jan.) 1922.

rence can be avoided; or, if it should transpire, the symptoms can be speedily alleviated by prompt and adequate digitalis therapy.

3. *Sudden Collapse.*—In one of his early papers, Frey,[12] who is responsible for pointing out the therapeutic possibilities of quinidin, cited two cases in which this accident occurred. Two more are reported by Haass,[13] and a fifth by Frey and Hagemann.[14] All recovered. Frey's description serves to illustrate the course of events. Both of his patients received, on the first day, two doses of 0.4 gm. each; on the second day, five doses of 0.2 gm. About three hours after the last dose, symptoms occurred suggesting cerebral paralysis. The patients first complained of dizziness and of feeling hot. Shortly thereafter they sank suddenly into a state of deep unconsciousness. They became pale, the respirations were slowed and then stopped, and soon no pulse was palpable. Artificial respiration, epinephrin, camphor and caffein were resorted to, with resultant resumption of respiration and cardiac activity.

In one case, consciousness returned in twenty minutes, but the patient remained in a peculiar state of mental excitement, having hallucinations and grimacing. There was great motor irritability as well. During this period, she understood all that was said to her. Three quarters of an hour after the beginning of the attack, the patient was mentally clear and felt quite well.

In the second case, unconsciousness lasted for several hours, and on three occasions became dangerously deeper, as evidenced by cessation of breathing and enfeeblement of the heart's action. Beads of perspiration stood on the forehead, and the extremities felt cold. Then followed motor unrest, with shaking movements of the upper part of the body, such as are seen in quinin poisoning, according to Lewin.[15] Four and a half hours after the beginning of the attack the patient became quieter, fell into a deep sleep, and awoke the following morning without the slightest knowledge of what had transpired. During the entire next day the patient appeared to be psychically disturbed in that he was forgetful, and only on the day following was his condition the same as before the attack.

In Haass' patient, a woman, aged 53, with mitral stenosis and heart failure, collapse followed 2.8 gm. of quinidin given in three and one-half days. She was revived with difficulty. However, her pulse subsequently became regular, and the signs of venous stasis disappeared. The happenings in the case of Frey and Hagemann were quite similar. A man, aged 37, received four doses of 0.2 gm. each. He complained of dizziness after the first dose. Shortly after the full amount was taken, unconsciousness ensued, to return after the lapse of one and one-half hours. He knew nothing of the onset of the attack or of the events which transpired during it.

There is nothing in the history or examination of these five patients which could serve to characterize them as peculiarly susceptible to the action of quinidin. It would be difficult to prognosticate and thereby avoid the possibility of an occasional occurrence of this nature.

4. *Occurrence of Rhythms Indicating Intoxication of the Heart Muscle.*—If the effects of quinidin administration are followed electrocardiographically, it is found[10] that in a number of patients, particularly those in whom it is not possible to establish normal rhythm, ventricular premature beats appear. At times, though infrequently, these may occur coupled with normal complexes,[10] as is seen in the early stage of digitalis poisoning. Occasionally such ectopic beats are transitory, disappearing within an hour or two. But often they persist and their frequency increases. Under the latter circumstances, they afford a sign indicating cessation of further therapy; for, if more quinidin is given, a succession of rapid, fairly regular ventricular ectopic beats may ensue, giving rise to the rhythm termed ventricular tachycardia. The possible serious significance of this disordered mechanism has already been indicated.[16] Ventricular tachycardia may be the immediate precursor of ventricular fibrillation and death. This rhythm has been observed five times in our experience, but has ceased with prompt discontinuation of further drug treatment.

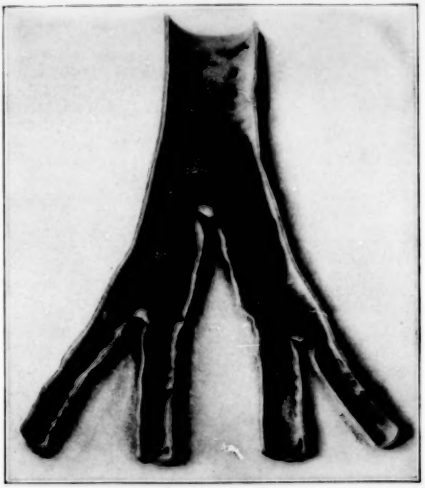


Fig. 2 (Case 24).—Drawing of the abdominal aorta dividing into its iliac branches, showing the occluding thrombus.

5. *Embolism.*—In Table 2 are collected the reported cases of embolism. Of these 9 patients, four died and one was left with a residual hemiplegia. The embolism occurred in seven instances within twenty-four hours after establishment of normal rhythm; in our own case, within forty minutes. Bits of clot lodged twice in the lung, three times in the brain, once in the kidneys, once in the spleen, once in both lung and kidney, and later, in this patient, *while the auricles were fibrillating*, in the popliteal artery. In only one of these cases was a necropsy performed: in Carter's case (Case 7, Table 2). This patient died with the symptoms of

12. Frey, W.: Weitere Erfahrungen mit Chinidin bei absoluter Herzunregelmässigkeit, Berl. klin. Wchnschr. **55**: 849, 1918.
13. Haass, H.: Ueber die Chinidintherapie der unregelmässigen Herztätigkeit, Berl. klin. Wchnschr. **58**: 540 (May 23) 1921.
14. Frey, W., and Hagemann, E.: Klinische und experimentelle Daten über Chinidinwirkung, Ztschr. f. d. ges. exper. Med. **25**: 290, 1921.
15. Lewin, L.: Die Nebenwirkungen der Arzneimittel, Berlin, 1899.
16. Levy, R. L. (Footnote 1, second and third references).

uremia, and necropsy revealed a mural thrombus in the auricle and extensive infarction of both kidneys.

The patient whose history was detailed by me in an earlier communication[9] subsequently died with the signs of closure of the abdominal aorta. A postmortem examination was made. It will therefore be of interest briefly to recapitulate the sequence of events and to complete the record.

K. C., a woman, aged 44, was admitted to the hospital complaining of shortness of breath and weakness. She had frequent attacks of tonsillitis and three attacks of chorea between the ages of 6 and 14. Eight years before entrance, the tonsils were removed. She had had symptoms referable to the heart for two years, and it is probable that she was suffering from fibrillation of the auricles during this period.

Examination revealed no dyspnea at rest, and no edema or cyanosis. The cardiac dulness extended 12.5 cm. to the left in the fifth space, 4.5 cm. to the right in the fourth space. The auscultatory findings were those of mitral stenosis. She had been taking digitalis before coming to the hospital; the ventricular rate was 80. The blood pressure was 112 mm. of mercury systolic, and 82 diastolic. There was slight, irregular fever at times, up to 101 F.

She was kept in bed and given, in all, 0.5 gm. of digitalis in the form of digitan. On the tenth day of hospitalization, quinidin treatment was begun. During a six day period, 6.8 gm. was administered. The patient complained at various times of headache, tinnitus aurium and slight epigastric discomfort. There was slight acceleration of ventricular rate on each day. At 8 p. m. on the sixth day, normal rhythm was observed by the nurse to be present. At 8:40, quite suddenly the patient fell unconscious to the floor. After being put back to bed, she had a generalized convulsion, involving both arms and legs. She became very noisy, restless and difficult to manage. When examined at 9:30 she was still unconscious and quiet. There was no obvious sign of a local cerebral lesion. At 10:15 there was another convulsive seizure. By 1:30 the following morning, consciousness had returned. She vomited twice, and then slept during most of the remainder of the day.

Normal rhythm, with a rate of about 90, persisted for thirty-six hours. Then fibrillation recurred, with a ventricular rate of 126, 117 beats coming through to the wrist. Digitalis served promptly to control the heart rate.

During the next twelve days, the clinical course was uneventful, save for an elevation of temperature to 102 F. on two occasions. Blood cultures were sterile. On the morning of the thirteenth day after the cerebral accident, the patient was awakened at 4:30 by severe pain in the left side of the abdomen. At this time she also complained that her feet, legs and hips were quite numb. She presented the appearance of a person in shock. The heart rate rose rapidly to 144; the temperature was subnormal. There was some tenderness in the abdomen in the median line over the abdominal aorta, and also in the left lower quadrant. No pulsation could be made out in either femoral vessel, or in the popliteal or anterior tibial arteries. There was a little purplish mottling of the feet and lower legs. A diagnosis of thrombotic closure of the abdominal aorta was made.

The following morning, the mottled cyanosis extended to the umbilicus. The patient was restless, pale and perspiring freely. A distinct pulsation could now be felt in the right femoral artery, and a less distinct wave in the left femoral vessel. The mottled cyanosis of the feet, legs and thighs was more pronounced. That afternoon, she died.

Necropsy was performed four hours after death. The heart weighed 430 gm. The mitral valve was deformed and thickened in such a fashion as to produce an orifice of the buttonhole variety. The chordae tendineae was contracted and thickened. There were no fresh vegetations along the free border of the valve cusps. On the auricular aspect of the valve, however, adherent to the wall of the auricle, at a point between the valve cusps, was a small, pear-shaped vegetation about 3 by 2 mm., its surface covered by a thin layer of adherent clot. The wall of the auricle was smooth, and there were no antemortem thrombi (Fig. 1). The aortic valve cusps were smooth. On the tricuspid valve were two tiny nodular vegetations, of the variety commonly associated with acute vegetative endocarditis; these were about 1 mm. in diameter. The heart muscle was not remarkable.

The lungs showed no areas of consolidation or infarction. The pulmonary vessels were dissected out to their finer branches, but no thrombi or emboli were disclosed.

When the aorta and iliac vessels were opened, an adherent, fresh, occluding thrombus was seen which had apparently begun at the bifurcation of the aorta into the iliac branches and extended upward, though not filling the entire lumen of the vessel, as far as the renal arteries. The thrombus also extended downward for a distance of 3 or 4 cm. into both external and internal iliac arteries (Fig. 2). No thrombi were found in the vena cava or its branches, nor was there any evidence of occlusion of any of the mesenteric vessels.

Permission to examine the brain was not granted. In view of this fact and in the light of the necropsy findings it is perhaps not justifiable to place too categorical an interpretation on the cerebral accident. It is conceivable that the attack of unconsciousness with convulsions may have been a manifestation of quinidin poisoning analogous to the cases described by Frey. On the other hand, the association of the attack with the establishment of normal rhythm is significant. It seems more likely that a small bit of the vegetation on the auricular aspect of the mitral valve was whipped off into the circulation and lodged in the brain. This conception is supported by later events; for it is reasonable to believe that the terminal thrombosis in the aorta was initiated by a small embolus from the same source, which became caught at the bifurcation of the aorta into its iliac branches and served as a nucleus for the formation of the larger clot.

It is a matter of common belief that clots tend to form in the auricular appendixes more commonly when the auricles are fibrillating than when the mechanism is normal. The findings of Lewis[17] lend support to this concept. Thus, in seventy-six postmortems in cases of chronic heart disease, in which clots were especially sought, he found them in eight cases out of twenty-three in which fibrillation was present in the last illness, and in only four cases out of fifty-three in which the mechanism had been normal. It was his impression, however, that embolism due to detachment of these clots did not appear to be more common when fibrillation existed than when the mechanism was normal. This statement is borne out in our own experience. Of the last fifty patients with auricular fibrillation admitted to the Rockefeller Hospital, twenty-five received the usual therapy, with digitalis if indicated; twenty-five received similar treatment, plus quinidin. In the group not treated with quinidin, embolism or thrombosis has occurred five times; in the group receiving quinidin, there has been one instance of probable embolism. It is, of course, significant that in the patients receiving quinidin, embolism has occurred shortly after the alteration in mechanism. Mackenzie[18] has called attention to a similar coincidence when the rhythm spontaneously changes from fibrillation to normal. It appears, however, that the danger of embolic accident after quinidin has been given undue emphasis. It is in patients with advanced heart failure that clots are likely to form in

17. Lewis, T.: The Value of Quinidin in Cases of Auricular Fibrillation, and Methods of Studying the Clinical Reaction, Am. J. M. Sc. **163**:781, 1922.

18. Mackenzie, J.: Quinidin in Auricular Fibrillation (a letter), Brit. M. J. **2**:576 (Oct. 8) 1921.

the auricles. If such cases do not respond promptly and well to efforts at treatment aimed to build up a cardiac reserve, especially if they are refractory to digitalis, it is probably wiser not to attempt to restore the normal mechanism. Signs of peripheral venous thrombosis should also be looked for, and, if present, serve as an index of a tendency for intravascular clots to form. In such individuals also, it is well not to attempt quinidin therapy.

6. *Sudden Death.*—There are three cases reported in which death followed shortly after the resumption of normal rhythm. Instances in which, at necropsy, bronchopneumonia was found (Benjamin and von Kapff) or in which death occurred several days after quinidin was taken (Hewlett and Sweeney), are not included. Nor is it fair to place in this group Groedel's patient, a man of 70, with heart block and Stokes-Adams' syndrome, whose heart at necropsy showed closure of the septal branch of the right coronary artery, with myomalacia and complete destruction of the conduction system in the crus commune.[19] In the case of Benjamin and von Kapff,[20] 0.2 gm. of the drug was given on the first day, and 0.6 gm. on the following day. Forty-five minutes after the establishment of normal rhythm, the heart suddenly ceased. Hewlett and Sweeney's case is described in a footnote: "A patient in fairly good compensation was treated with quinidin and died suddenly shortly after his heart had become regular."[21] No necropsy was performed in either of these cases. One instance of sudden death has occurred in this hospital and has been described in detail.[9] The heart ceased one hour and forty minutes after inception of the sinus rhythm. Necropsy failed to reveal the cause of death. In the absence of facts, speculation as to the reason for the cessation of the heart's action under these circumstances is futile.

COMMENT AND CONCLUSIONS

From this summary of the untoward effects of quinidin administration, several points of significance for clinical therapeutics are apparent. It is clear that not every patient suffering from fibrillation of the auricles should receive this drug. It has already been pointed out,[9] and it is evident from Table 1, that persons with conspicuous cardiac enlargement, that is, with apex impulse outside the nipple line, and particularly if there are multiple valve lesions, are least likely to respond with normal rhythm. Such enlargement may be taken to indicate serious derangement of cardiac mechanics by valvular disease or of extensive myocardial involvement, or both. It is in these cases also that ventricular tachycardia occasionally occurs. Patients with but little cardiac enlargement and without signs of valvular defect have, in our limited experience, done well. The duration of fibrillation and the etiology of the disease appear to be of lesser importance as factors determining the issue.[22]

A careful study of the patient's symptoms while the drug is being given may also be of value. When unpleasant sensations are complained of early in the course of treatment, and persist or recur with further administration, it is probable that normal rhythm will not be restored, or, if established, will be present for only a short time. It is in these cases also that ventricular tachycardia is likely to ensue. The occurrence of unpleasant symptoms may likewise serve as a guide by means of which cases of sudden collapse, as described by Frey, may be avoided. At all events, little is to be gained and possibly harm may be done, by persisting with therapy in the face of complaint of serious discomfort by the patient.

Occasionally one encounters a patient in whom, in spite of rest, restricted fluid intake, digitalis, etc., it is not possible to restore adequate compensation. The heart muscle is exhausted. It is in such cases that mural thrombi are likely to form in the auricles, and it is in them that the danger of embolism after alteration of the cardiac mechanism is greatest. Signs of peripheral venous thrombosis should also be looked for, and, if found, serve to indicate the tendency for the formation of intravascular clots. Such patients should not be given quinidin.

Careful clinical study of patients with auricular fibrillation will serve to set apart a certain number unsuitable for quinidin treatment. It is hoped that further experience will serve to furnish more definite criteria for eliminating unfavorable and selecting favorable cases. The carrying out of therapy in bed, in a hospital, preferably under graphic control, will further safeguard against accident. It is well to emphasize again that, "carefully administered, this drug is a therapeutic agent of great value; indiscriminately given, it may, on occasion, be expected to cause disastrous results."

19. Groedel, F. M.: Ungünstige Chinidinwirkung bie vollkommenem Herzblock? Therap. d. Gegenw. **62**:172, 1921.
20. Benjamin and von Kapff: Ueber die Behandlung der Arhythmia perpetua mit Chinidin, Deutsch. med. Wchnschr. **47**:10 (Jan. 6) 1921.
21. Hewlett, A. W., and Sweeney, J. P.: The Quinidin Treatment of Auricular Fibrillation, J. A. M. A. **77**:1793 (Dec. 3) 1921.
22. Experience with auricular fibrillation in patients with hyperthyroidism is as yet too limited to permit of defining helpful criteria in this group.

CAVERNOUS ANGIOMA OF THE TONGUE

REPORT OF CASE

ELMER H. FUNK, M.D.
Assistant Professor of Medicine, Jefferson Medical College
PHILADELPHIA

Personal experience and a review of the literature would indicate that angioma of the tongue of the type exemplified by the present case report is rare.

REPORT OF CASE

D. C., a man, aged 42, was admitted to the White Haven Sanatorium in 1919 with the diagnosis of pulmonary tuberculosis. The symptoms and signs on admission pointed to an old moderately advanced pulmonary lesion of low activity. The sputum examination revealed tubercle bacilli. After five months' stay at the sanatorium, he was discharged on demand. The pulmonary lesion had become quiescent, and his general condition greatly improved. At the physical examination on admission, the patient's lips had a cyanotic appearance. This was in striking contrast to the absence of respiratory disturbance. On close inspection the lips were found to be involved in a capillary nevus extending from the mucocutaneous margin to just within the inner fold of the lips. The lower lip presented the bluish appearance to a more marked degree than the upper lip. When the mouth was opened, the protruded tongue revealed a swelling on the left side. The patient protruded the tongue with reluctance, having guarded against the recognition of the abnormality since early life. He stated that his mother had noticed that there was a small birthmark on the tongue shortly after birth. This grew rapidly at first, and later remained stationary. As far back as the patient can remember it has maintained its present size

in relation to the size of the oral cavity. It has never given rise to bleeding, and has not interfered with mastication or swallowing. He stated that at times "the saliva flowed freely between meals," and occasionally his "speech was a little thick." These symptoms, however, had been so slight as to cause only passing notice. The accompanying illustrations show the appearance of the tongue. The oral cavity was otherwise normal.

COMMENT

The pathology of angioma of the tongue does not differ from that of angioma elsewhere in the body. These tumors belong to the benign growths of congenital origin or development early in life. The term cavernous angioma, which describes this case, refers to that form in which the tumor is composed of widely dilated anastomosing vascular channels separated by thin, fibrous septums. These tumors may be encapsulated and stationary, or encapsulated with gradual enlargement and invasion of neighboring tissues. The enlargement is slow in development, and results from the distention of the original vascular spaces and the formation of new ones. These tumors are not infrequently a development from capillary nevi, and may be multiple. Ewing [1] refers to reported cases in which from forty to 100 tumors were observed in one subject. There is the very rare type of histologically nonmalignant angioma with numerous metastases. Shennan [2] refers to two cases in the literature, and reports an instance in which angioma, displaying no sarcomatous changes or other histologic indication of malignancy, gave rise to numerous secondary growths throughout the body. Locally, angiomas undergo changes as the result of inflammation, thrombosis and ulceration. Hemorrhage may occur and phleboliths may form. Spontaneous regression may occur as the result of the local changes mentioned above or from treatment. Symptoms referable to pressure on adjacent structures may develop with the growth and extension of the tumor. The tumor may recur after apparently complete removal.

Fig. 1.—Dorsal aspect of tongue. Angioma involved left half of tongue. The sharp limitation of the tumor in the median line is distinctly visible. The bluish color, the appearance of vessels and vascular points on the surface, and the soft consistency are rather typical of angioma. The irregular surface was smooth and moist, and sensitive to ordinary stimuli. On pressure the growth could be reduced in size, but immediately filled up again when pressure was removed. Pressure on the venous return in the neck produced no appreciable change in the size of the swelling. No enlargement of the cervical glands was detected.

Cavernous angioma of the tongue, according to Ewing, arises usually in the tip of the organ, and may extend until it produces an erectile tumor of large dimensions. In the case reported by Hughes [3] and in our patient, a small swelling on the dorsum of the tongue was noticed shortly after birth and diagnosed as a birthmark. In Hughes' patient the tumor had become the size of a large marble when adult life was reached. No pain, ulceration or hemorrhage occurred. For ten years, however, a chronic indigestion had been present which was attributed to difficulty in mastication. In our patient, aged 42, the tumor had remained the same in size and was without discomforting symptoms as long as he could remember. The occasional excessive flow of saliva between meals and thickness of speech caused only slight inconvenience. Bland Sutton [4] states that in some instances lingual nevi cause very little inconvenience unless they bleed, and this accident may arise at any time, either by abrasion from hard food or from accidental bites, or in consequence of rubbing against jagged teeth. Under such conditions the hemorrhage is sometimes very alarming, and so oft repeated that surgical measures are imperative.. Arrowsmith [5] reports the instance of a girl, aged 12 years, who had from birth a tumor on the left side of the tongue. On several occasions she had bitten the tongue and started more or less severe hemorrhages which were at times difficult to control. It is interesting to note that the clinical diagnosis in this case was aneurysmal varix of the tongue. The tumor was removed completely, and after operation was pronounced a cavernous angioma

Large cavernous angiomas in children may interfere with breathing, especially if adenoids produce postnasal obstruction. Heaton [6] observed an angioma of the tongue in an infant, aged 4 months. The tongue was involved at birth and rapidly enlarged to the point at which the cheeks bulged and the organ protruded beyond the lips. Suffocative attacks occurred, especially at night. The angioma involved chiefly the left half of the tongue from the tip to the epiglottis. Following ligation of both lingual arteries, the tongue and the tumor became greatly reduced in size. In a short time, however, enlargement returned and caused attacks of dyspnea which finally resulted in asphyxia and death. Lett [7] likewise observed a cavernous angioma in the tongue of an infant. The tumor was bilateral, and when the child cried the bluish color and swelling became intense.

The progress of angiomas of the tongue varies in different cases. In our patient the growth remained stationary over many years. In the case reported by Gibson,[8] a woman, aged 28, first noticed a black spot on her tongue when 16 years old. This increased in

1. Ewing: Neoplastic Diseases, Ed. 2, 1922, p. 2.
2. Shennan: Histologically Non-Malignant Angioma with Numerous Metastases, J. Path. & Bacteriol. **19**: 139, 1914.
3. Hughes, F. M.: A Case of Congenital Angioma of the Tongue, Lancet **2**: 749 (Nov. 17) 1917.
4. Sutton, J. B.: Tumors, Innocent and Malignant, Ed. 4, London, Cassell & Co., 1906, p. 168.
5. Arrowsmith: Cavernous Angioma of the Tongue, Laryngoscope **25**: 94, 1915.
6. Heaton: Clinical Notes from the Children's Hospital: Large Venous Naevus of the Tongue Causing Sudden Death from Asphyxia, Birmingham M. Rev. **37**: 228, 1895.
7. Lett: Naevus of the Tongue, Clin. J. **40**: 30, 1912.
8. Gibson: Cavernous Angioma of the Tongue and Mouth, Ann. Surg. **32**: 129, 1900.

size slowly for eight years, and then grew rapidly during the next four years, extending during this time to the floor of the mouth, one tonsil and the hard and soft palates. When the patient was seen by Dr. Gibson, he felt that any operation would be very bloody, if not impossible, on account of the extent and character of the lesion. Hulen's [9] patient, a woman, aged 43, had a typical cavernous angioma involving the left half of the tongue and measuring 3.4 by 3.2 by 3.5 cm. The tumor had been present for twenty years without change in size and without causing symptoms except for a slight impediment of the speech.

The removal of angiomas may be followed by a recurrence, as in the patient reported by Rigby.[10] Two years after the tumor had been dissected out and the right lingual artery and veins ligated, the patient was found to have a recurrent cavernous angioma of the right border and dorsum of the tongue.

The importance of recognizing the smaller and less evident angiomas is exemplified by Miller's [11] experience, in which a supposed enlarged papilla at the base of the tongue was removed. Considerable hemorrhage followed, and much difficulty was encountered in the effort to control it. The angiomatous character of the lesion was recognized after operation.

The diagnosis of cavernous angioma of the tongue as a rule offers no difficulty. At times the enlargement of the tongue, due to lymphangioma (lymphangiomatous macroglossia), calls for differentiation from hemangioma. In lymphangioma the bluish appearance is seldom evident, the surface contains groups of small vesicles containing clear fluid, owing to dilatation of the superficial lymph spaces, and recurring inflammation, with pain and swelling of the tongue, is common. This liability to recurring attacks of inflammation causing progressive enlargement of the tongue is a striking characteristic of lymphangioma. The occurrence of nevi elsewhere in the oral cavity suggests the character of the tongue tumor, but is not conclusive evidence of the angiomatous character of the lingual lesion. For example, Howell [12] reports the case of a child, aged 6 years, who had a congenital nevus of the lower lip involving the mucous membrane of the gum, and a lymphangioma of the tongue. The nevus would bleed at times, and the lymphangioma of the tongue presented the characteristic vesicles, which would break down and ulcerate; the tongue becoming exceedingly painful at times and progressively enlarged.

Fig. 2.—Lateral view, showing posterior limit of tumor near base of tongue. The irregular surface and tortuous vascular channels are distinctly evident. No pulsation was visible. No superficial vesicles, as are frequently seen in lymphangioma, were present.

Our patient, because of the stationary character of the lesion, and the freedom from symptoms, refused to consult the surgeon and radium therapist for an opinion as to the advisability of local treatment.

1318 Spruce Street.

9. Hulen: Report of a Case of Cavernous Angioma of the Tongue, New York M. J. **62**: 531, 1895.
10. Rigby: Cavernous Nævus of the Tongue, Clinical Society's Transactions **39**: 230, 1906.
11. Miller: Angioma of the Base of the Tongue with Specimen and Slide, Brooklyn M. J. **12**: 41, 1898.
12. Howell: Lymphangioma of the Tongue, Brit. J. Child. Dis. **16**: 213, 1919.

TRAUMATIC EROSION OF AN ANOMALOUS RIGHT SUBCLAVIAN ARTERY

THROUGH THE POSTERIOR WALL OF THE ESOPHAGUS *

HELEN M. SCOVILLE, M.D.
NEW HAVEN, CONN.

Anomalies of the great vessels, while thoroughly described in textbooks, are not often found at the necropsy table, and when discovered they are generally considered of little clinical importance. The present case, therefore, is of unusual interest since an accidental injury to an anomalous artery was the immediate cause of death.

The patient was a sturdy white boy, 9 years of age.[1] The physical and mental development were normal and general health good. There is one point of interest in the patient's early history. As a small child he apparently experienced some difficulty in swallowing, since he refused to take solid food until after he was 3 years old.

The onset of the fatal illness is somewhat obscure, but probably antedates death by about seventeen days, when the boy awoke with a severe frontal headache, which persisted and which was the next day accompanied by fever and vomiting. The temperature was 104 F., and the illness was attributed by the family physician to a smallpox vaccination which had been performed four days previously. The child's condition remained the same for several days, and then improved. This apparent improvement was only temporary, and the child became more seriously ill a few hours later. He was restless and stuporous, and responded only momentarily to stimuli. Because of the seriousness of his condition, the child was sent to the hospital by his physician.

On admission, the patient was unconscious. The temperature was 103 F., and the respiration was regular and somewhat increased in rate. There was a generalized muscular rigidity of the body, with hyperactivity of the tendon reflexes. A diagnosis of epidemic (lethargic) encephalitis was made. The problem with which the clinician was confronted was that of a very sick boy who was unconscious and who could not be given food because of spasticity of the muscles of the lower jaw. A nasal tube was therefore inserted and left in place, and through this water and food were administered at regular intervals.

For a week the patient's condition remained essentially unchanged. He was kept well nourished by the use of

* From the Brady Laboratory of Pathology and Bacteriology, Yale University School of Medicine.
1. I am indebted to Prof. Edwards A. Park for the use of the clinical history of the case.

gavage, and the prognosis seemed hopeful; but, without warning on the morning of February 15, he began to expectorate bright red blood, and rapidly went into shock, showing a pale, clammy skin and weak pulse. The nasopharynx was packed with gauze, and the usual methods used to combat shock. A transfusion was started, but death occurred before it could be completed.

The necropsy findings were definite. The gastro-intestinal tract as far as the transverse colon was filled with freshly clotted blood. The stomach was so greatly distended that the clot which was removed virtually paralleled the liver in

Fig. 1.—Traumatic erosion of an anomalous right subclavian artery through posterior wall of esophagus.

size. No bleeding points could be found in the mucosa of the stomach or intestine. The esophagus was therefore removed and opened with unusual care in the search for the source of the hemorrhage. There were several superficial longitudinal ulcers along the posterior wall in the folds of the mucosa (Fig. 1). One of the ulcers, situated about 7 cm. from the superior edge of the larynx, showed a raw base with a small mass of fibrin adherent at about its center point. Beneath this fibrin plug was a small perforation of the esophageal wall. The perforation extended into a large arterial trunk, which was adherent to the esophagus. This artery, on being traced, was seen to arise from the aorta on the left side, and to run across the esophagus at practically a right angle.

The thoracic aorta was carefully studied and was seen to have four large branches given off in this order: right common carotid, left common carotid, left subclavian and right subclavian, the last mentioned being the vessel which passed from left to right behind the trachea and esophagus as described above. Figure 2 shows clearly the origin and relations of the branches.

The brain was removed, and the diagnosis of epidemic encephalitis confirmed by microscopic examination.

COMMENT

The case presents several unusual features. The presence of an anomaly of the great vessels is in itself of some interest. The arrangement of the arteries in this case exemplifies a well recognized deviation from the normal which is apparently found in a definite number of individuals. Goldbloom [2] gives the percentage of occurrences in anatomic dissections as from 0.4 to 1.6 per cent. Such an anomaly is rarely discovered at necropsy, since the routine procedure in removing the neck organs is not such as to lead to its detection. The structures are generally removed by "blind" dissection and the vessels cut near their origin, and in this way the variation may pass unnoticed.

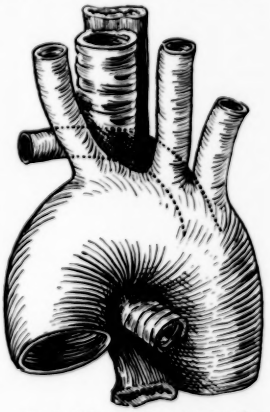


Fig. 2.—Point of origin and course of an anomalous right subclavian artery.

The method of origin of such an anomaly is developmental, and is considered to be due to a persistence of the lower right arch. Under normal circumstances, this primitive right branch of the aorta undergoes partial atrophy, leaving one arch. Development may be abnormal and both arches may persist, in which case rotation of the heart brings the right arch behind the trachea and esophagus. In the type of anomaly under discussion, it is assumed that the lower half of the right arch remains in the form of the subclavian vessel, and this accounts for the peculiar relationship between the vessels and the neck organs noted above. As Goldbloom suggests, the cause of such an anomaly probably rests in the failure of development of the fourth arterial arch, which normally forms the innominate, and the subsequent persistence of the lower right arch, which continues to function as the right subclavian artery.

The chief point of interest in the case is the clinical application. It is a relatively common practice to insert a nasal tube for feeding comatose patients, and not infrequently the tubes are left in place to minimize the trauma incident to repeated introduction. In persons

2. Goldbloom, A. A.: The Anomalous Right Subclavian Artery and Its Possible Clinical Significance, Surg., Gynec. & Obst. 34:378 (March) 1922.

with normal vessels, this process is practically without danger; but in a small group (from 0.4 to 1.6 per cent.) in whom there is an anomalous artery lying against the posterior wall of the esophagus, the continued use of a feeding tube is obviously fraught with danger.

It seems logical that such an anomalous artery will compress the lumen of the esophagus and cause difficulty in swallowing. Goldbloom quotes several instances among his series of similar anomalies in which dysphagia was described clinically. In this case the boy had had difficulty in swallowing as a small child, but had entirely overcome his handicap so that if he had died in adult life this possible clue would have been lost. The fact unfortunately remains that this type of arterial anomaly cannot be determined clinically. The long continued use of a feeding tube must, therefore, always be considered dangerous in an undeterminable group of persons. Because of this, the clinician should be warned of the possible occurrence of fatal accidents similar to the one which caused the death of this child.

ZONULE PROTECTION IN CATARACT EXTRACTION *

A. E. EWING, M.D.
ST. LOUIS

The several discussions on cataract and the causes of failure in extraction, at the St. Louis session of the association in 1910, suggested that injury to the suspensary ligament or zonule of the lens was a factor in the failures. With the hope of eliminating a portion of this injury, I began a series of experiments in the removal of the anterior capsule of the lens, trying to do it in such a way that there would be the least possible traction on the zonule in the manipulation of the extraction. Although the number of these operations has not been great, the results are instructive, not only in regard to the immediate subject—i. e., the removal of the capsule—but also in subjects near akin to it, such as posterior capsule interference with vision, residual cortex, loss of vitreous, prolapse of the iris, the corneal incision, and the value of cultures.

TECHNIC

The patients operated on number 105. They were not specially selected, but were the run of patients as they presented themselves. With each of them, cultures from the eye that was to be operated on were taken on agar-agar, and negative results were required over a period of three days before the operation was attempted. As *Bacillus pyocyaneus* was found in one of the cultures, and *Staphylococcus albus* and *aureus* in many of them, there is no question about the protection of this procedure to both patient and operator. Another evidence of this protection lies in the fact that seven of these patients had lost the fellow eye under the care of other operators, when, according to the statements of the patients, such cultures had not been taken. Possibly all might have been saved had this precaution been exercised.

The anesthesia employed was phenacain (holocain), 1 or 2 per cent. and cocain, 5 per cent., the phenacain being used every ten minutes for thirty minutes or longer preceding the operation, and the cocain for not longer than ten or twelve minutes. In addition to this, during the last three years, I have injected, subconjunctivally, above the cornea to either side of the intended conjunctival flap, a minim (0.06 c.c.) of a solution of cocain, 5 per cent., in epinephrin, 1:4,000, three minutes previous to making the incision. It is placed on either side of the flap because several times the margin of the pupil has dilated beyond the clear cornea when the injection was placed directly above the incision. The day previous to operating, atropin, 1 per cent., was used, except in suspected glaucoma, and again the morning previous to the operation and with the anesthetic at the time of the operation. All of these solutions were freshly prepared in a 1:20,000 solution of mercuric chlorid, with as much sterilizing as is possible with the cocain.

Fig. 1.—A greatly enlarged drawing, which shows the serrated knife edge of the last mentioned capsule abscission forceps. Actual length of cutting blade, 5.5 mm.; width of each blade, 0.75 mm.

For fixation, the double fixation forceps were employed, and for the incision, the rectangular keratome was used in forty-seven of the cases, and the Graefe knife in fifty-six; in two, the record does not mention the instrument.

The method of making the corneal incision has been to keep as near as possible within the clear cornea, just at the sclerocorneal junction, with the Graefe knife, beginning from 2 to 2.5 mm. above the horizontal meridian and finishing with a conjunctival flap of from 3 to 5 mm., and with the rectangular keratome, beginning in the conjunctiva 2 mm. or more above the cornea and slipping the knife forward so as to keep at the clear corneal margin. If the incision proved to be too small, it was enlarged with the iris scissors. With sharp scissors, this is a harmless, safe procedure, provided the scissors blade that enters the anterior chamber is kept in front of the iris. Blunt ended blades, however, are to be preferred, as with them the danger of injuring the iris is lessened.

In every case with one exception, there was a small or a medium sized iridectomy upward or a previous iridectomy. In the exception, the pupillary margin became lost behind the clear cornea, owing to the subconjunctival injection of cocain-epinephrin above the corneal wound, and a simple extraction was performed. In each case, the iris was replaced from the angles of the corneal wound before the use of the capsule forceps and again after the delivery of the lens.

In the first few cases, the capsule was cut through by means of de Wecker scissors. Frequently, only a small slit was obtained, and it was necessary to enlarge this with a sickle needle. Then a notch and a tooth were tried on the end of scissors of the McClure type; then forceps with a knife blade of the sheep shearing type; then forceps with an undulating blade of the bread knife type. At times, any of these would slip over the surface of the lens. This led to the present type of forceps, in which the teeth are sharp and the sulci in between have a sharp knife edge. It was with

* Read before the Section on Ophthalmology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

this instrument that most of the operations were performed (Fig. 1).

The method of using these forceps has been to enter them closed and pass the ends of the blades down to, or back of, the lower pupillary margin, then to let the blades open as wide as may be desired, 4 or 5 mm. or more, then close them, and repeat this action two or three times, with the object of certainly cutting through

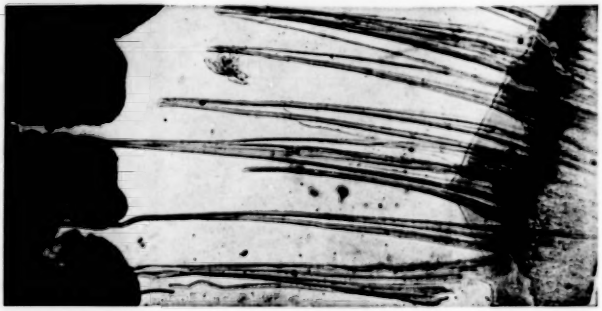


Fig. 2.—Fibers of the zonule of Zinn, showing their attachment to the ciliary processes and their insertion into the anterior capsule of the lens.

the capsule and also of breaking up the lens cortex. The forceps are then removed closed. Usually, they bring the capsule.

The delivery of the lens has been effected by supporting the posterior lip of the corneal wound by the edge of the wire loop and making direct backward pressure on the cornea at its lower margin with the convex back of a lens spoon. As the lens came away, the spoon was made to follow it, maintaining the pressure on the cornea. This usually brings away the cortex. Anterior chamber irrigation was not resorted to in any of the cases, but physiologic solution of sodium chlorid was syringed sideways across the lips of the wound after the lens delivery. By suction, this will frequently assist in removing blood and cortex from the lips of the wound and from the anterior chamber.

RESULTS OF OPERATION

There was no prolapse of the iris in any of the cases at the time of operation, and none at the first dressing, usually four days later. In four, there was slight loss of vitreous, in two moderate loss, and in two, great loss. The last patient had suffered with severe diseases of the cornea and the iris in previous years. Each, however, recovered as good vision as could be expected with a badly scarred cornea.

Two of the patients had moderately updrawn pupils, not above the corneal center, one above the center, and in a fourth, an extraction after a bombé iris and a closed pupil, the new pupil was in the limbus. By means of an iridotomy, however, vision of 20/150 was obtained. In a fifth, the capsule forceps became tangled in the iris, because of blood in the pupil, the result being a large iridodialysis which extended over the pupillary center, and the pupil proper floated to and was fixed near the corneal wound. Vision of 20/38 was obtained through the iridodialysis without subsequent needling. In another case, the forceps hung the iris for the same reason, and caused an iridodialysis from below, but there was a good pupil and good vision. By these two cases, I was taught not to use the forceps when the pupillary margin was obscured by blood.

In three of the cases, all of them unripe lenses, a great deal of cortex remained, which required several months for complete absorption. There was no irritation from the cortex in any of them. One of these patients was 76 years old, another 73, and the third 70. The last was highly myopic, 14 diopters, and suffered with central retinochoroidal degeneration. A thin posterior capsule remained, and vision was 20/192. With the first, the resulting vision without discission was 20/24, and with the second, the vision was 20/15 without discission. These cases demonstrate how slight the irritation from the cortex is if it remains within the capsule.

In none of these cases was there any infection of the wound, or, so far as could be determined, any deep infection, although in the one with light perception the eye was very sore after the extraction and a closed pupil was the result. It was a case of posterior synechia complete, and bombé iris. The inflammation seemed to be due to the trauma in removing the lens from its adhesions. A subsequent iridotomy, months later, was followed by extensive hemorrhage into the anterior chamber. All the patients with very low vision after the operation had previously suffered with old corneal scars or with scars from former fundus diseases or glaucoma.

Fig. 3.—Zonule: distribution of fibers to anterior and posterior surfaces of the lens at its periphery.

The visual results for the 105 cases were:

For 21, 20/15; 18, 20/19; 9, 20/24; 16, 20/30; 17, 20/38; 2, 20/48; 5, 20/60; 3, 20/75; 2, 20/96; 1, 20/120; 3, 20/150; 1, 20/192; 2, 10/150; 1, 10/192; 1, 10/240; 1, 5/192; 1, hand movement; and for 1, light perception.

SUMMARY

In this compilation of cases is shown the slight obstruction to vision that is caused by the posterior

capsule. In eighteen of them, the history was such that nothing in the way of perfect vision could be expected. Of the remaining eighty-seven, vision sufficient for all practical purposes was obtained, in sixty-four of them excellent reading vision and in seventeen very good reading vision, as shown. Thus far a discission of the secondary membrane has been required in thirteen cases. These discissions were not attended by any inflammation. Many patients with vision of from 20/24 to 20/15 were operated on from five to eight years ago and still retain this vision. This continued excellent vision may unquestionably be attributed to lack of zonule disturbance, as no foundation was laid in the operation for a future low grade hyalitis.

THE ZONULE

In closing this article it is of importance in connection with the subject to refresh our memories with anatomic specimens of the zonule, several of which have been carefully prepared. The specimens are practically normal lenses and zonules taken from eyes that were removed because of orbital or intra-ocular neoplasms. From three of the specimens, the photographs reproduced in the accompanying illustrations were taken.

The first specimen (Fig. 2) shows the implantation of a number of the fibers of the zonule, or ligament of the lens, on the anterior capsule, and the extension and attachment of several of the fibers to the ciliary processes.

The second specimen, a thick meridional cross-section, indicates the manner in which the fibers of the zonule are distributed to the anterior and the posterior surfaces of the lens near its periphery (Fig. 3).

The third specimen (Fig. 4) shows the quantity of fibers that constitute the zonule in one half of the lens, their attachment to the ciliary processes and their insertion into the lens capsule. The specimen is a very careful dissection made by my assistant, Dr. Weymann, and is mounted in a 5 per cent. solution of liquor formaldehydi after a method devised by him.

Each of these specimens clearly demonstrates the strength of the zonule and points to the mischief that may be caused by its injury in an operation for the removal of the lens.

Metropolitan Building.

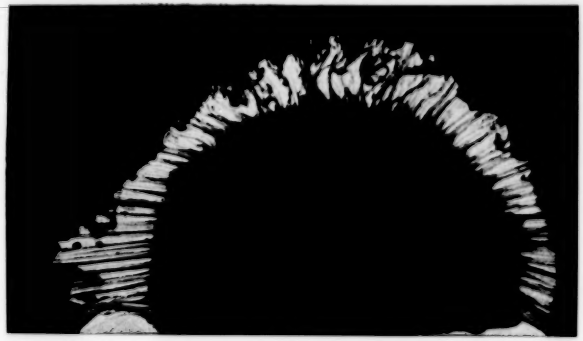


Fig. 4.—Zonule throughout half its circumference, showing the number of fibers and their connection with the lens and the ciliary processes.

ABSTRACT OF DISCUSSION

DR. ALLEN GREENWOOD, Boston: During recent years a great deal has been brought out regarding treatment of cataract. Colonel Smith, and those modifying his method, and Hulen and Barraquer, have been the chief exponents of the intracapsular operation. Thirty-two years ago, on leaving the hospital to enter private practice, I was warned by Dr. H. W. Williams and Dr. Oliver Wadsworth not to operate as long as the patient could count fingers at three feet, or until the edge of the iris failed to cast a shadow on the opaque lens when using oblique illumination. For the beginner, this rule is still most excellent, and if followed until he acquires good operative ability will save him much trouble and many anxious moments. This rule is the safest one to follow where the cataract in one eye starts toward maturity far in advance of that in the other eye. In such a case, if, when the cataract becomes fully matured in the most advanced eye, the other eye is sufficiently involved so that the patient can read only with great difficulty, then the mature cataract should be removed by the classic method. If the better eye still has good useful vision, it is wiser, as a rule, not to remove the mature cataract unless it begins to show signs of hypermaturity. Opinions differ on this point, and it must be decided by each operator according to the conditions present. Many patients have slowly advancing lenticular opacities, especially of the nuclear type, with both eyes nearly equally affected. By our former rule, these patients will be doomed to years of incapacity and dependence, and yet if operated on by the unmodified classic method, the dangers resulting from the inevitable retention of stick cortex makes the outcome uncertain. It was this class of cases which led operators to modify our methods in an effort to prevent the retention of cortex, or to insure the removal of all cortex by delivering the lens in its capsule.

It seems inconceivable, however, in the light of all our experiences, that any intracapsular operation will ever take the place of classic methods, especially for fully mature cataracts.

No form of intracapsular extraction should be tried on patients by the beginner in ophthalmic surgery. He should perfect himself in operative technic by operating on the eyes of animals, and then be allowed to operate in the clinic only on fully mature cataracts by the combined extracapsular method, never first on immature cataracts, or on an only eye, or in complicated cases.

After many such operations, he may, if he wishes, diverge from the beaten path and, in selected cases, substitute for his toothed capsule forceps a pair of smooth bladed ones and attempt an intracapsular operation. I do not attempt intracapsular extraction in cases of fully mature senile cataract, nor in cases with completely sclerosed lenses. Neither is the operation applicable to cases with high myopia or known fluid vitreous. There is always the question whether the loss of the zonule is a serious defect or not. In selected cases, such as lend themselves to this operation, the dangers of vitreous loss are no greater than with the older methods, and the immediate good results are most gratifying to patient and to physician. I am convinced, however, that no one method of operating for cataract is applicable to all types of cases.

DR. G. C. SAVAGE, Nashville, Tenn.: I want to refer to the intracapsular operations that have been done in the order of their introduction and in the order of their danger, which is precisely the same. First, Smith; second, Savage; third, the forceps operation; fourth, Hulen. The Smith operation is too dangerous—for Smith or anybody else. There is some

danger attending my operation. The forceps operation is safer than either of the other two, but the shifting of the lens from side to side is dangerous and all wrong. When you grasp the capsule with the forceps you should rotate it on its antero-posterior axis and then lift the lens out without any trouble. The Hulen operation, if an apparatus could be devised that was not clumsy, would be ideal. In this suction operation, you must get a firm grip on the anterior capsule of the lens and then rotate it on its anteroposterior axis. If somebody will devise a means by which the clumsy apparatus can be discontinued and still allow suction to keep up, then I feel that the Hulen operation will be the perfect one.

DR. L. D. GREEN, San Francisco: In the February number of the *American Journal of Ophthalmology*, our apparatus and technic which modify the suction operation for cataract are described. Should we operate immediately or should we advise the patient to wait until the cataract matures —a period that may vary from six months to the remainder of the patient's lifetime? The patient does not care what procedure you follow—he wants to regain his sight. Cataract operations may generally be classified in two groups, (1) expression operations and (2) extraction operations. The classic capsulotomy and the Smith-Indian operation are expression operations, while the Knapp and Stanculeanu forceps operation, as well as the Hulen and the Barraquer suction methods, are extraction operations. In the one case, the cataract is removed by pressure from without; in the other, by extraction with some instrument. In studying the various steps of the two principal procedures, we have gradually evolved a technic which is a combination of expression and extraction. It consists of making a full half corneal section with a conjunctival flap. The flap is grasped with a special delivery forceps and the cornea is raised. The cannula, held in the right hand, is introduced into the eye and gently placed on the anterior surface of the cataract. The motor pump is turned on, and, by pressure on the foot valve, the vacuum is opened. A few seconds are allowed for the capsule and anterior part of the lens to mold into the cup, and then with slight rotation of the canula the cataract is lifted out of the eye. The moment when rotation of the cataract takes place, the delivery forceps which holds the conjunctiva releases it and is shifted to the lower part of the eye, near the limbus, and with gentle pressure assists in lifting the cataract out of the eye. In this way we obtain an expression-extraction, and with less trauma to the eye than would occur were either procedure used alone.

DR. A. E. PRINCE, Springfield, Ill.: Eighty-eight per cent of men operate on the unripe cataract. Fourteen fix the degree of blindness at 20/200, or 10 per cent. A good result at this period will secure the gratitude of the patient, which is a criterion of a successful operation. As to the advisability of performing an intracapsular extraction, I make an incision as though I intended to extract the lens in its capsule. The incision should include almost the entire upper half of the cornea and a narrow conjunctival flap, which insures a quick sealing of the wound by coagulated aqueous humor. The incision is made with a special knife, the back of which, commencing 10 mm. from the point, is made to widen out to prevent the premature escape of the aqueous at the heel. After the counter-puncture, the point is made to cut upward with the advance of the thrust while the heel of the blade is held downward. With the thrust, the blade is carried to the apex of the anterior chamber before the escape of the aqueous has a chance to permit the iris to be pushed forward over the edge. A special spatula which is a part of the lid elevator is then made to depress the scleral edge of the wound at the same time that moderate pressure is applied with a spoon to the lower third of the cornea. Failure of the upper edge of the lens to break out the zonula and enter the aperture is taken as an indication that the zonula is sufficiently strong to justify the abandonment of the idea of an intracapsular extraction. In that case, a capsulectomy is undertaken, as follows: The lid elevator is turned over to the assistant; the cornea is elevated by grasping the conjunctival flap; a vertical incision is made in the capsule while withdrawing the cystotome along the operator's right hand side of the lens; the free margin of the capsule is then grasped with capsule forceps and withdrawn by a motion toward the left, by which almost the entire anterior capsule will be removed. A spoon dipped in sterilized oil is made to depress the lower fourth of the cornea and follow the escaping lens with a zigzag motion to free the anterior chamber of cortex. The same method of delivering the lens in its capsule is followed, provided the zonula has ruptured when pressed against the depressed scleral margin of the incision. The delivery of the lens in its capsule is often facilitated with advantage by applying the terminal of a suction instrument, after the manner of Hulen and Barraquer.

DR. GEORGE S. DERBY, Boston: A majority of ophthalmologists are not doing the Smith operation but are following other methods, especially a modification of the Knapp method, which is the one I prefer. It would be a great thing to be able to tell in what cases we should do this intracapsular extraction. Verhoeff experimented on rabbits, determining the type of case in which there were retained fragments of lens within the eye which will produce inflammation. Then human beings were vaccinated with dried lens material, and according to whether or not a reaction occurs he can determine on the type of operation. In regard to the bacteriologic examination of the eye, I wish to call attention to Avery's medium which will grow pneumococci and streptococci very quickly and uniformly in from six to ten hours; a great advantage. You can send your patient into the hospital the afternoon before, and by the time of operation next morning you have the report on the culture. One other point is the blocking of the facial nerve described by Van Lint. I have practiced this for several years in a large series of cases and I am more impressed every day with the great advantage to be obtained by injecting from 0.5 to 2 c.c. of 1 per cent. procain solution. The lids are relaxed and when you take out the speculum the lids stay open. I feel very much more confident when operating on such an eye than I did before I adopted this procedure.

DR. FRANK S. AUTEN, Belleville, Ill.: There seems to be a little lack of sympathy for a procedure that may mean more for vision than any other ever used. When it is possible for the lens to be removed in the capsule, that is the thing to do. The Drs. Green follow an ideal technic for the removal of the lens. They remove the lens with less traumatism and less effort than I have ever seen used in the removal of a lense. I realize that the so-called Smith technic can not be used in all cases, but if you will take hold of this subject with a little more sympathy, I believe that many men who today criticize the intracapsular method will be in favor of it. The only competition for the Smith technic that was suggested was the Hulen method, and that is an ideal method of getting the lens out of the eye. The less traumatism the better; it does not make any difference what method you use.

DR. JOHN H. BURLESON, San Antonio, Texas: I have been doing this operation for four years and it is the one I have decided to adopt in my practice in selected cases. The criticism that the operation is more dangerous and requires more skill to perform is, I believe, erroneous. Colonel Smith, in my opinion, has developed a method of cataract extraction that is a distinct advance. I would like to stress a few points. First, the corneal incision must be large and at its upper margin it must be well below the limbus. On the corneal incision depends the success of the operation. A conjunctival flap in this operation is a mistake. The delivery of the lens is more difficult and vitreous loss more likely. When possible, it is well to do a preliminary iridectomy, as it simplifies the operation and one usually has a better acting patient at the time of extraction. I believe that most accidents occurring during cataract extraction are caused from the use of the speculum. I do not think the hooks devised by Colonel Smith and others are any safer than the speculum. It has been my practice for some years to have the lids held by the fingers of a trained assistant. The possible loss of some vitreous in the Smith operation is more than made up for by the brilliant results obtained. The most serious criticism to be advanced against this operation is the high degree of astigmatism due to the corneal incision. I am firmly convinced that it will be the operation of the future. I have observed that ciliary involvement following this

method of operating is far less likely, and that after-treatment is seldom necessary. The hostile criticism that the Smith operation has received, I do not think is well founded or entirely fair, as many competent men whose judgment cannot be questioned are doing this operation and getting results. After all, the object of cataract extraction is to give the patient vision, and if an operator gets results from this operation, I do not think he should be criticized as being radical, or taking undue risk with his patient.

DR. JOSEPH S. LICHTENBERG, Kansas City, Mo.: In protecting the zonule one of the most important things is to get complete anesthesia. In my experience, the cocain we have been getting in recent years has not the anesthetic qualities that it had previous to the war. My druggist informed me that there are several qualities of cocain, and that the one with the large crystals is the most anesthetic. I have found this true. In addition to the blocking of Von Lint, I believe a subconjunctival injection is necessary to get complete anesthesia. The point Dr. Ewing makes that injection immediately over the attachment of the superior rectus interferes with the movement of the eye is well taken, and the injection to one side is still better. Another point is the method of enlarging the incision with scissors. This is rather a crude method, as the tissues do not heal so well. A few years ago, I presented what I call my secondary knife. It is simply a sharp pointed keratome, to be slipped through the wound and over the iris or the capsule, using the sides for cutting. This is used only in enlarging the primary incision. As to determining what type of operation to use, I have tried a number of Smith extractions, some with brilliant results and some not so brilliant. My plan is to make a large incision, a small conjunctival flap, and a small iridectomy. Then I apply the Smith hook, as described by Smith himself. With it, pressure not to exceed the amount necessary to remove the lens after capsulotomy is made. If this fails to deliver the lens, I open the capsule and extract the lens extracapsularly.

DR. M. HAYWARD POST, St. Louis: Dr. Ewing's method leaves no ragged edges nor shreds of cortex to be entangled in the lips of the incision. His forceps differ from all others in the peculiar construction and size of the blades. As a result of the large, sharply cut opening in the anterior capsule, the nucleus is expressed with great facility, very little force being required, from which it follows that the percentage of vitreous loss is considerably reduced, lens cortex, even in comparatively immature lenses, is very seldom retained, and traction on the ciliary body is reduced to a minimum. Eyes operated on in this manner have retained vision undiminished for many years. In one of my cases of high myopia in which the cataract had been mature for eighteen years, the forceps failed to take hold of the capsule, but neither would the cystotome tear through this very tough specimen, so eventually the point of the Graefe knife had to be used. In two cases in which there was considerable hemorrhage into the anterior chamber, use of the forceps was persisted in, contrary to Dr. Ewing's advice, as the lens was still quite immature and a large opening of the capsule was desirable in order that all cortex might be expressed. To my gratification, I found that a large part of the hemorrhage was discharged on introducing the forceps. The iris was easily seen and the capsulotomy made without difficulty. In one case with a slight iris bombé and almost complete posterior synechia, by means of the forceps, the entire pupillary portion of the lens capsule was removed and a fine, clear, well situated pupil was obtained. The eye recovered without complications in the usual time. In only one case, with myopia of 20 diopters, did vitreous appear in the incision and here not more than one drop was lost, an amount insufficient to prevent proper dressing of the wound. Healing took place without disturbance. In only one case was any swelling lens cortex left in the pupil. In no instance has it been necessary to needle an anterior capsule; in two cases the posterior capsule has been needled. Four of these cases are so recent, however, that it is impossible to state whether needling will be necessary or not, though at the present time the pupils are all clear, with the exception of one in which an infection occurred. Loss of vitreous occurred in less than 6 per cent. The anatomic specimens prepared by Dr. Ewing show beautifully the construction of the suspensory ligaments of the lens. They give a clear idea of the forces to be overcome in the intracapsular removal of cataract, and are very suggestive for further laboratory study along these lines. This method of removing the anterior capsule is of great value and is quite adaptable to immature cataract but not to the morgagnian type. It reduces the danger of vitreous loss, nicely cleans away the anterior capsule, and traumatizes the eye to a less extent than any procedure I have observed.

SOME NOTES ON THE EFFECTIVENESS OF THE VENEREAL DISEASE PROGRAM *

H. G. IRVINE, M.D.

Director, Division of Venereal Diseases, Minnesota State Board of Health; Associate Professor of Dermatology and Syphilis, University of Minnesota Medical School

MINNEAPOLIS

Four years ago it was my privilege to present a paper [1] before the Surgeon General's Conference in Washington outlining a state program against venereal diseases. This program was based very largely on work done in California, the first state to organize and finance a bureau of venereal diseases, and in Minnesota, where the work was organized some months later. This program included medical work, such as epidemiologic investigation of cases, organization of clinics, distribution of arsphenamin and the reporting of cases; laboratory work, such as Wassermann tests, examination of smears for gonococci, and dark field examinations for spirochetes; social service work, such as investigation of sources of infection, the rounding up of delinquent patients and in some cases stimulation of law enforcement against prostitution, and rehabilitation of delinquents; and educational work with both the laity and the medical profession in a variety of ways.

Within a comparatively short period nearly every state organized some work more or less along this line. Three years ago I [2] attempted to evaluate the various items in this program, which until then had been very largely a war measure. Since that time the work has been devoted largely to the civilian population, and much has been written to cover the steps in the progress made. Most of this is familiar, and there seems no occasion to repeat it here; but most of us have now had sufficient experience, and enough time has elapsed to make it worth our while to take account of stock and discuss the effectiveness of that work. Taking account of stock is an excellent way to discover whether we have records of any value, and we must know something of the effectiveness of our methods if we are to continue spending public funds now, when economy is so necessary and yet seems so rare. It is hoped that this study may stimulate similar ones in other states, and provoke discussion which will lead to more effective measures.

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* From the Division of Venereal Diseases, Minnesota State Board of Health.

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Irvine, H. G.: An Efficient State Program Against Venereal Diseases, Soc. Hyg. 4:453 (Oct.) 1918.

2. Irvine, H. G.: The Venereal Disease Campaign in Retrospect, J. Cutan. Dis. 37:748 (Nov.) 1919.

One of the prime objects of our work has been the gathering of statistics which would give some indication of the morbidity of syphilis and gonorrhea. Practically every state has put in force a system of notification. In order that I might have recent data, a questionnaire was sent to every state; twenty-five replies [3] were received. In these states and Minnesota, there were reported, in 1920, 71,106 cases of syphilis and 97,823 cases of gonorrhea; in 1921, 65,644 cases of syphilis and 75,542 cases of gonorrhea. Including Minnesota, ten states showed increased reports of syphilis and seven showed increased reports of gonorrhea, while sixteen showed decrease of syphilis and nineteen decrease of gonorrhea. Of the total number of cases, six showed an increase and twenty a decrease. There is approximately an 8 per cent. decrease of syphilis and a 13 per cent. decrease of gonorrhea in all totals of each disease. While it is true that with all the work that has been done we might very well expect a decrease in morbidity, it is also a fact, I think, that reporting has at no time represented the true morbidity; and if reporting has become more effective, as it ought to with proper effort, then I believe that reporting ought to remain on a level at least, even if there were some real decrease in morbidity.

Many successful clinics continue to increase in size, and physicians known to be conscientious in reporting show no decrease; consequently, I doubt whether fewer people are being treated. Also, many officials in replying have stated frankly that they believe reporting has fallen off. Several states known to be doing effective work with many good clinics, good social service and with a mass of educational work behind them are among those showing increased reports; surely, if reporting indicated morbidity, these states ought to show a decrease.

The figures for the second million draft examinations are conceded to represent the best survey that has been made of the civilian population. Chart 1 shows the rate per 10,000 based on the percentage of venereal disease in the draft. It also shows the estimated rate per hundred thousand of population based on case reports for 1920-1921. If the rate for the draft was true for the rest of the population, then the line representing case reports should be ten times as high. However, many things must be taken into consideration. First, according to our studies as indicated in another chart, nearly 50 per cent. of all venereal infections occur during this draft age period; so the rate for the total population would be much less than this. On the other hand, except in a few instances, the diagnosis of syphilis and gonorrhea in draft examinations was made only in cases in which the disease was evident. Routine Wassermann tests would have added greatly to the percentage of syphilis, and careful expert examinations for chronic gonorrhea would also have increased that percentage. My own opinion, not based on actual figures, is that these factors would have made the rates for venereal disease at least three or four times greater. It may be said that during the last three or four years the work has decreased the rate as compared with draft figures. This might affect gonorrhea, but not so many cases of syphilis are cured in four years, although they might be if they were treated all that time. Taking all these factors into consideration, I believe that our reporting rate, as shown on the chart, ought to be represented by a line at least five times as high as that representing the draft rate if reporting represented morbidity.

In Minnesota the line for reporting is about twice the height of the draft rate, which is as good as that for any state we have had opportunity to study.

Some one has suggested that cases be reported by laboratory report, figuring that it might be possible to get all physicians to submit all specimens to the state laboratory and then check the positive findings. We have made a study of our positive laboratory findings,

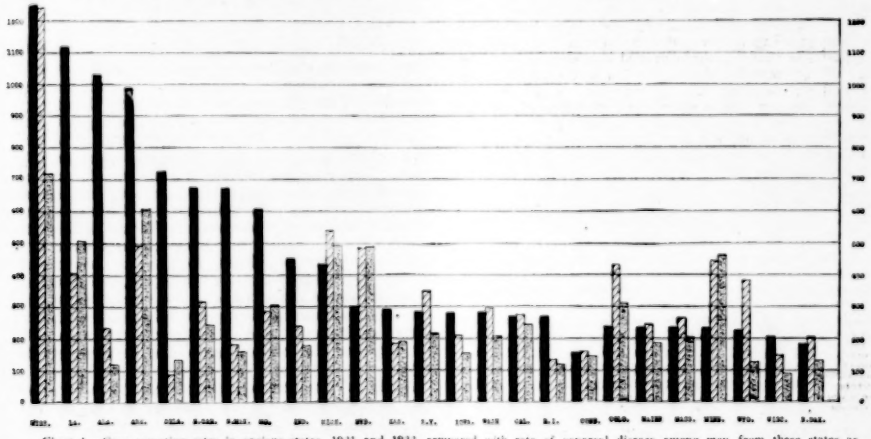


Chart 1.—Case reporting rates in various states, 1921 and 1922, compared with rate of venereal disease among men from these states as indicated by examinations of the second million called in the draft: solid columns, draft examination rate per 10,000; shaded columns, case reports per hundred thousand, population in 1920; stippled columns, case reports per hundred thousand population in 1921.

3. The states replying were Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Iowa, Kansas, Louisiana, Maine, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, New Mexico, New York, New Jersey, North Carolina, North Dakota, Rhode Island, South Dakota, Washington, Wisconsin and Wyoming.

as indicated in Charts 2 and 3. It appears that the percentage of positives is rather constant for both syphilis and gonorrhea, syphilis running from 10 to 15 per cent. and gonorrhea from 30 to 40 per cent. However, the sum total of these positives is only about 50 per cent. of our case reports, as indicated in Table 1.

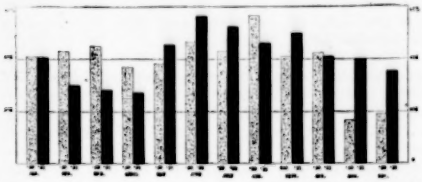


Chart 2.—Percentage of gonorrhea smears giving positive results, 1920, 1921.

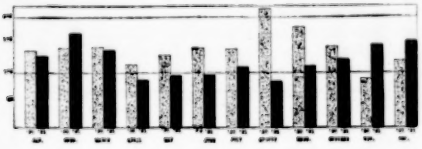


Chart 3.—Percentage of Wassermann tests giving positive results month by month, 1920 and 1921.

TABLE 1.—NUMBER OF CASES REPORTED MONTH BY MONTH COMPARED WITH NUMBER OF POSITIVE FINDINGS IN LABORATORY SPECIMENS

	Syphilis		Gonorrhea	
1920	Cases Reported	Positive Wassermann	Cases Reported	Positive Smear
January	308	105	397	57
February	264	83	424	58
March	309	100	492	73
April	397	121	482	63
May	392	129	503	79
June	317	149	535	94
July	411	185	709	99
August	379	271	509	122
September	432	284	514	130
October	430	257	516	141
November	321	130	473	99
December	342	195	470	89
Total	4,451	2,009	6,020	1,105
1921				
January	500	208	663	87
February	486	227	470	101
March	586	240	530	98
April	408	161	439	104
May	285	159	372	152
June	314	175	537	222
July	291	208	575	183
August	414	241	667	230
September	303	214	545	219
October	402	238	562	215
November	375	281	563	207
December	361	301	488	182
Total	4,815	2,853	6,277	2,004
1922				
January	343	258	487	174
February	317	272	445	171
March	418	310	454	132

The question has been raised as to whether there was not a constant seasonal variation in venereal disease incidence; this ought to show in Minnesota if anywhere, for we have fairly hot summers and cold winters. A study has been made of this and the tabulations charted (Chart 4) showing reports for three years for comparison. There is possibly a little higher incidence in the warm months. In two years, 1919-1920, there was a marked increase in July; in 1919 and 1921 there was an increase in October, most marked in 1919, and it is interesting to note that a study made at that time showed a considerable increase in reported sources of infection from commercial prostitutes. This was possibly occasioned by infections which took place in September incidental to our state fair, at which time many thousands come to the cities and there is usually an influx of prostitutes.

A study made of the reports on each disease as well as the totals (Chart 5) indicates that usually there is an increase in each disease when there is an increase in

TABLE 2.—AGE DISTRIBUTION BY FIVE YEAR GROUPS OF ALL CASES REPORTED FOR 1919, 1920, 1921

	No. of Cases Reported			Percentages		
	1919	1920	1921	1919	1920	1921
Under 16	300	350	706	3.1	3.5	6.8
From 16 to 20	1,280	1,500	1,297	13.2	15.4	12.5
21 to 25	2,531	2,646	2,835	26.2	27.0	27.5
26 to 30	1,823	1,908	2,110	19.0	19.7	20.5
31 to 35	1,170	1,267	1,185	12.1	12.9	11.5
36 to 40	858	818	863	8.9	8.4	8.4
41 to 45	435	497	529	4.5	5.0	5.3
46 to 50	228	227	250	3.4	3.4	2.8
Over 50	910	450	486	9.6	4.7	4.7
Totals	9,644	9,761	10,301			

the total. It is rare for a total increase to be caused by any marked increase of one or the other disease. There are too many factors influencing reporting to permit the drawing of any definite conclusions.

Another question relative to reporting which has interested me very much has been that of reporting by name or by number. At the outset, many were opposed to reporting of any kind, and many are still opposed, with what I believe is good reason, to the reporting of all cases by name. Some states and a few cities require reports by name in every case. I have no data at hand to compare their reporting with localities not requiring

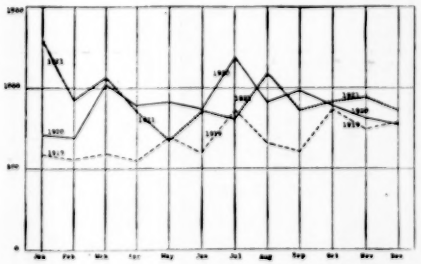


Chart 4.—Total cases reported month by month for 1919, 1920 and 1921.

the name. In Minnesota, reports of name and address are required only in delinquent or incorrigible patients, although the report may be by name. A study of our figures indicates a constant increase in reporting by name, and this is with no solicitation or request on our part. A study of Chart 6 shows a definite increase in reports from private practice in the two largest cities, and 85 per cent. of all reports from physicians outside these cities is by name. Sixty-nine per cent. of all cases are reported by name. We feel that this is due to two reasons: (1) reporting direct to the state board instead of to the local board, and (2) the fact that our profession has confidence in the department.

I do not believe that our reporting would be as good if required by name, and, furthermore, so long as we have names in those cases in which investigation is necessary, why require it in all and possibly antagonize those on whom the success of the work largely depends?

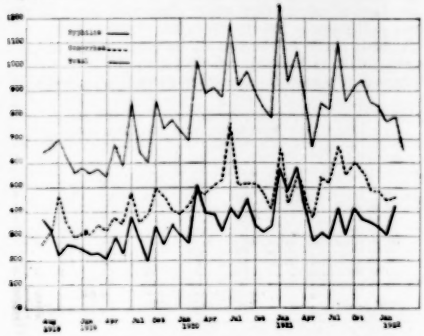


Chart 5.—Reports on each disease, as well as the totals: solid line, syphilis; broken line, gonorrhea; crossed line, totals.

A study of age groups develops some interesting data and also some food for thought. Three years' records show that the five year period 21-25 is consistently the highest, and that the group age 21-30 consistently includes nearly 50 per cent. of all cases (Table 2). The group from 16 to 20 shows some decrease during the past year, and the group under 16 has doubled during the past year. Thinking that the last might be indicative of an increase in juvenile delinquency, we

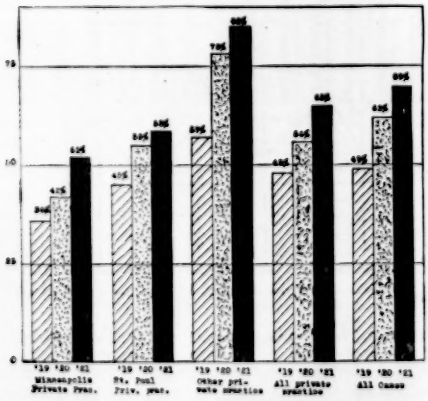


Chart 6.—Percentage of venereal disease cases reported by name, 1919, 1920 and 1921.

made a careful study of all these cases and found the increase almost entirely due to congenital syphilis. This means that more cases of congenital syphilis are being diagnosed either by the assistance of the laboratory or on account of the social service work in infected families. We have been repeatedly urged to emphasize sex hygiene and venereal disease education to girls and boys of school age, some even being in favor of work in the grade schools. If our greatest incidence is from 21 to 30, would it not seem to indicate that we ought to concentrate a little more in that period? Chart 7 shows graphically the age distribution, both male and female, for a typical month, and Chart 8 shows the age distribution for male, female and total for each year from 14 to 33, in which period 75 per cent. of all the cases occur.

In an effort to study further juvenile delinquency we made some studies from our social service records to see whether we were having occasion to investigate and handle an increasing number of younger persons. It must of course be borne in mind that other organizations are more likely to be called on to handle these cases than is ours—this accounts to a degree for the small number below the 20 year mark. However, in comparing the work of March, 1921, with March, 1922, we find (Chart 9) that from 16 to 26 at almost every age we have had fewer cases, while from 26 on we have had an increased number. Chart 10 offers an opportunity to study both male and female cases for

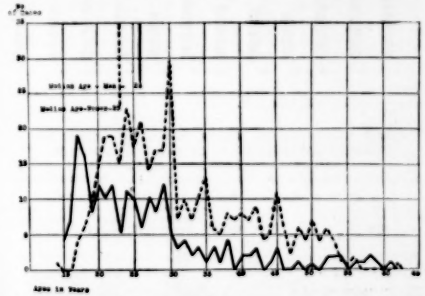


Chart 7.—Age distribution of cases of venereal disease for a typical month—March, 1922: solid line, male; broken line, female.

March, 1921, and March, 1922, at the various ages. Another study of a total of 2,553 social service cases for 1920, and 2,569 cases for 1921, was made to study their origin. It was found (Chart 11) that there was a decrease in the cases coming from physicians. This may mean, in view of the fact that he is reporting more cases of the diseases, that he has fewer delinquents. On the other hand, there has been a marked increase in the cases coming from hospitals and dispensaries; perhaps they are appreciating more and more the value of the state board of health because of its being an official agency with police power. Social agencies have reported only a little over half; this probably means that patients whom they formerly handled and would have to turn over to us are now already going to hospitals or dispensaries, and if they get to us at all they come from the latter agencies.

The laboratory work in the venereal disease program is a most important one, and it is hoped that every state is making use of this opportunity to secure the cooperation of the medical profession, as well as to render valuable service to the people. The work in our laboratory has grown during three years from nothing to more than 2,000 specimens a month. Some impression must be being made on physicians when in the month of March this year they report about 1,000 cases but

investigate more than 3,000, as indicated by laboratory specimens (Chart 12). Much harm may come from this laboratory work too; false positives may lead to false diagnoses; the reports of partial and incomplete positives make it possible for the unscrupulous physician to urge his patient to take treatment. Laboratory findings should be checked by physicians' clinical findings. Only complete positive or complete negative reports should be given out; all others should be reported as "doubtful" or "unsatisfactory," with a request for further specimens. We must recognize the difficulties of the Wassermann test and guard people against wrong interpretations.

TABLE 3.—WORK OF DIVISION OF VENEREAL DISEASES, MINNESOTA STATE BOARD OF HEALTH

	1919	1920	1921
Cases Reported:			
Syphilis	3,326	4,451	4,815
Gonorrhea	4,622	6,040	6,277
Chancroid	107	228	202
Total	8,055	10,699	11,294
Laboratory:			
Wassermann tests	5,610	14,964	23,271
Smears	698	3,234	4,975
All examinations, including dark field	5,707	18,251	28,475
Subsidized Clinics:			
Patients admitted	2,087	1,639*	704
Treatments given	20,602	32,588	23,982
Arsphenamin:			
Doses distributed	5,682	8,177	5,094
Social Service:			
Cases handled	2,760	3,806	4,051
Number of towns in which cases were investigated	82	175	181
Educational:			
Number of pamphlets distributed	108,525	167,081	52,528
Number of exhibit days	67	439	237
Attendance at exhibits	45,038	73,495	36,740
Film shows	128	132	104
Attendance at film shows	47,010	41,412	30,130
Lectures	180	108	62
Attendance at lectures	28,500	3,700	3,230
Number of towns reached	.....	178	167

* Does not include persons carried over into this year, but admitted last year. In all, 2,261 persons were treated this year.

Some studies should be made to get at the effectiveness of treatment in clinics; groups should be studied to see how long they attend and how much treatment they receive. Too many states have been satisfied

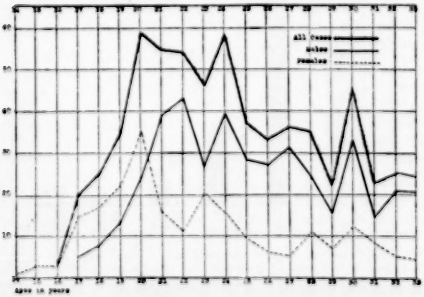


Chart 8.—Age incidence, cases reported in March, 1921.

merely to have clinics and have patients attend—the real test is the question of cure.

A careful study should be made as to where money is being spent, from the standpoint of being able to show practical results to the people. Chart 13 shows the percentage of our budget expended for various items in the program during 1919, 1920, 1921 and 1922 (estimated). In spite of a large increase in many lines, our administration cost has increased very little. We have gradually decreased our educational expenditure because we felt that our state was pretty well covered the first year or two, and now it remains simply to keep the work going. In spite of increased numbers of treatments and of people being treated, our cost of

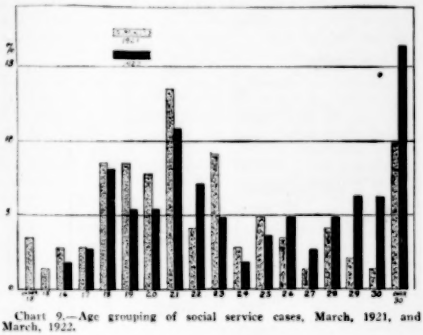


Chart 9.—Age grouping of social service cases, March, 1921, and March, 1922.

this item has increased very little, and during the last year has been reduced by decentralizing clinics or putting them on a pay basis. Our social service has been an increasingly important factor, and we have accordingly increased our expenditures in this direction. Our laboratory work has tripled, and yet the cost has only doubled. I believe that money should be spent in increasing amounts on laboratory, social service and treatment facilities. I see little justification for elaborate expensive educational campaigns, results of which are questionable and cannot be evaluated. I have little patience with state boards of health that have spent immense sums of money for quarantine and attempted rehabilitation of prostitutes. This work, as done from a medical standpoint, has little effect on venereal disease, and should be incidental to constructive work carried on by the courts and charged against other funds. No prostitute can be quarantined long enough to make her anything but a prostitute, and no social service work without indeterminate or permanent detention can control her. Consequently, our work with prostitutes should be for educational purposes, to show the high percentage of disease; then let the courts handle this entire problem as a legal one, and the proper state body look to the reformation and control with incidental medical treatment. Under present conditions the courts sentence diseased prostitutes and find it convenient to turn others loose.

Every state with a properly organized and operated venereal disease department should be able to place before its legislature a tabulation such as that reproduced in Table 3, and show a dollars and cents return in practical service to the people which would leave no question as to the value of the investment. Treatments, laboratory tests and arsphenamin distributed and injected can be directly translated into money.

For the future, we need to solicit more and more the cooperation of the medical profession; we must have the reports of physicians, and they must be given in a spirit of cooperation. The people must get their treatments from physicians and we want them to get them right. We must not antagonize physicians by admit-

ting private patients to clinics. We must improve our clinics by careful study of our records. Social service should be increased, but it should be sane and sensible, and it should go with the physician and not a mile ahead of him. Educational work should be continued

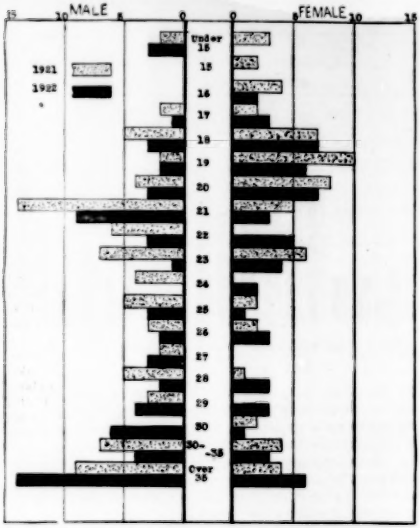


Chart 10.—Distribution of social service cases by age and by sex, comparing March, 1921, with March, 1922.

but possibly emphasized on older age groups than we have been trained to believe. Many states have been crippled somewhat by lack of federal appropriation. With its resumption, the best advantage should be taken of it.

Research work which has gone on with federal aid has justified itself, and it is hoped that it may be continued. Public health institutes have served a purpose, and can from experience be made more useful. One important thing in connection with them is the amount of time a number of recognized specialists have given; the assistance of these men has been invaluable, and it is to be hoped that every state will make use of any opportunity it has to secure aid from such men.

ABSTRACT OF DISCUSSION

DR. VALERIA PARKER, Washington, D. C.: Dr. Irvine brought out quite clearly the importance of the source of infection with relation to venereal disease. Our department has developed a very definite method of procedure in dealing with the areas of infection. We found that in spite of a very careful physical examination and of education, in spite of good living conditions, in spite of prophylaxis, there were certain areas in which the existence of venereal disease is far beyond the average rate. Wherever this condition exists there are areas of open houses of prostitution easily accessible. We have, therefore, developed a system of sending to the houses confidential inspectors to find out where these sources are. During the war it was necessary to intern prostitutes and to institute isolation. Isolation was not a very successful method of dealing with the prostitute who was reinfected many times over. We then developed the system of dealing with the individual girl or woman from another point of view in an effort so to change her environment and possibly her inclination for promiscuous conduct as to prevent a reinfection. During this year, because of the cost of carrying on our program, instead of supplying workers capable of dealing with the individual prostitute, we have simply retained three expert workers who stimulate the communities to take part in this program, and provide their own workers with delinquent girls. The relationship between the measures instituted for closing open houses of prostitution and dealing with the inmates after the closure is perhaps most clearly shown in Columbus, Ga., where early last summer the venereal rate was about 1.43 per thousand. Following closure of certain houses we secured a drop of 25 per cent. We have also interesting figures concerning the morbidity rate of venereal disease. Prior to the war the morbidity rate was about 90 per thousand. We have succeeded in reducing it to 62. In the U. S. Army the days lost from venereal disease were more numerous than from any other cause. The cash value of lost days through venereal disease exceeded $1,400,000 in 1920.

DR. WILLIAM F. WHYTE, Madison, Wis.: There is one agency in Wisconsin which has done more to prevent venereal disease than any other, and that is prophylaxis. The natural point of prophylaxis is the Wisconsin eugenic law. Every man in Wisconsin who is going to be married has to get a statement that he is free from venereal disease. The second point is that education on that subject has done a great deal to do away with venereal disease. Every man and woman who is to be married knows perfectly well what will happen to a girl if she marries a man with gonorrhea or syphilis, and every man knows what is going to happen to his wife. Our health officers and medical men report a falling off in the cases of gonorrhea and syphilis they are treating all over the state of Wisconsin. There is a great increase in the number of persons with chronic cases reporting for treatment. They speak about breaking up houses of prostitution. One street in Milwaukee, River Street, on which there were a number of houses of prostitution, is now a street of hotels. A man in Milwaukee who rented his building for a house of ill fame got into trouble because the board of health had the district attorney get after him.

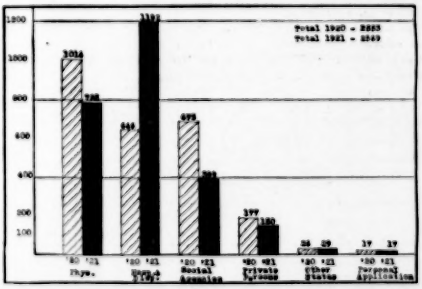


Chart 11.—Sources from which social service cases were referred.

There is a great falling off in venereal disease in Milwaukee. Two years ago one of our investigators studied the hygienic conditions in the militia camp at Camp Douglas. He examined 1,600 young men, all of draft age, and found four cases of gonorrhea. I do not believe one can find those results anywhere but in Wisconsin.

DR. CARL VOEGTLIN, Washington, D. C.: I want to say a word on the relation of the method of administration of arsphenamin to control of syphilis. Arsphenamin was first given intramuscularly. The intravenous method was adopted because of the local reactions and pain which followed the intramuscular administration. I believe that a great step

forward would be taken if the administration of the drug were simplified, and for that reason we have done some work during the last year at the Hygienic Laboratory in Washington to simplify the administration of arsphenamin. We have prepared a derivative of arsphenamin which can be given subcutaneously. It has proved very effective under experimental conditions, and is now being tested clinically. I believe that this compound will make it possible to put a greater number of syphilitics under the controlling influence

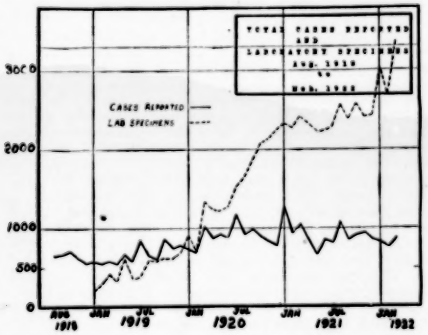


Chart 12.—Total cases reported and laboratory specimens, August, 1918, to March, 1922.

of arsenic. A good many physicians hesitate to give arsphenamin intravenously. I have no doubt that the subcutaneous administration of this compound is perfectly safe, and therefore could be used by any physician.

DR. J. P. BOWDOIN, Atlanta, Ga.: In Georgia, a state that had the second highest incidence of syphilis during the draft, there was a 4.5 per cent. reduction in brain syphilis in our asylums last year. Statistics show that physicians out in the country have been educated sufficiently to use arsphenamin in time to prevent brain syphilis. The question of education is perhaps the biggest question in the whole problem of the control of venereal disease. We have attempted to educate the physicians in Georgia as well as the laity. Each year we hold in our large cities an institute clinic for physicians. The institute clinic last year represented seventy-one counties of our state. The men spend a week studying nothing but venereal disease. Our physicians last year administered from our office 25,000 doses of arsphenamin. I have very little confidence in reports from physicians. They vary too much. The question of educating the physician to report cases has been one of the biggest problems we have had. The education of the people is beginning to show itself in ways we did not dream of when we began. A few years ago we would not have thought of mentioning this subject in the presence of women. Now we give lectures before women's clubs. The question in the South, of course, is a very serious problem because of the negro population. There is more infection in the negro race than in the white. They will not return for treatment. It is a still more serious problem as far as accidental infection is concerned, because we have a large percentage of accidental infections from nurses who are syphilitics.

DR. J. F. HOGAN, Baltimore: I do not think we have done anything in the control of gonorrhea, and it is difficult to do anything because at present it is difficult to say how long it is infectious. In the past year I think we have done something toward the control of syphilis. Beginning this year we started to have syphilis reported according to its stages, most of our reports of syphilis coming from the laboratories in the way of positive Wassermann reactions. The physician states the stage of the disease with which the patient is suffering or with which he suspects the patient is suffering. It was then decided that every three months we were to send out a questionnaire to physicians on these primary and secondary cases requesting them to inform us whether the patients were still cooperating with them in their treatment; that is, if the patient had taken enough arsphenamin and mercury to render him noninfectious. If the physician says that the patient is cooperating, we do nothing further for three months and, if the physician says that the patient is not cooperating, we send a woman social investigator, working under the direction of the bureau of communicable diseases, to that individual to have him return to the physician or to the clinic for treatment. First she tells him he must return to the physician and, if he does not return to the physician or the clinic, the health officer is detailed to see him. A venereal disease clinic is absolutely of no value unless there is a proper follow-up system. Clinics should be rated primarily as to their follow-up system. I do not know that we can compel tertiary patients to continue treatment, but we can compel primary and secondary cases. The reporting by the so-called quack has been very good, while the reporting by prominent urologists and syphilographers has been very poor.

DR. HARRY G. IRVINE, Minneapolis: I have no great sympathy with state boards of health spending a lot of money for the control of the prostitute. Law enforcement per se is what has an effect on venereal disease. The closing of all houses is what should be done. Merely taking one or two girls and putting them away for two or three months' quarantine does not amount to anything. One cannot turn a prostitute into anything but a prostitute by quarantine. It takes a much longer time. From the standpoint of simplified treatment I want to sound a warning. I hope the United States Public Health Service will not be too anxious to put out simplified methods. There are a number of physicians just waiting for such a thing. There are very few men who cannot give arsphenamin. I dislike this shortcut medical treatment. We are just now beginning to have some idea of the value of arsphenamin. I have had fifteen or twenty years' experience in syphilis and particularly in the late stages; it takes a long time to learn the effects of treatment

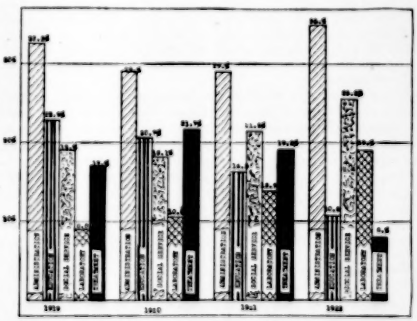


Chart 13.—Percentage of appropriation expended for various activities, fiscal years ending June 30, 1919, 1920, 1921 and 1922.

on syphilis. Expert methods are necessary for the diagnosis of gonorrhea; the laboratory is almost useless in gonorrhea in the male in the chronic stage.

Mammary Hypertrophy.—Williams points out that the normal increase of the female breast at puberty is due "even more to the overgrowth of its fibro-fatty envelope than to the glandular estasia," whereas during pregnancy, the increase in size is almost entirely due to the physiological overgrowth of the glandular parenchyma, and puberal hypertrophy conforms with the latter more than with the former changes.—Greig, *Edinburgh M. J.*, April, 1922.

A REPORT ON PNEUMOCOCCUS INOCULATION IN NEW YORK STATE INSTITUTIONS

G. W. McCOY, M.D.
Director, Hygienic Laboratory

H. E. HASSELTINE, M.D.
Surgeon, U. S. Public Health Service
WASHINGTON, D. C.

AUGUSTUS WADSWORTH, M.D.
Director and Bacteriologist in Charge, Respectively, of the Antitoxin, Serum and Vaccine Laboratories, Division of Laboratories and Research, State Department of Health
AND
MARY B. KIRKBRIDE
ALBANY, N. Y.

The purpose of this paper is to record the results of a study of the practical value of prophylactic inoculation against pneumonia among the inmates of certain New York State institutions, a study which was conducted jointly by the Hygienic Laboratory of the United States Public Health Service and the Division of Laboratories and Research of the New York State Department of Health.

PNEUMOCOCCUS INFECTION AND PNEUMOCOCCUS IMMUNITY

In order to interpret the significance of the results of any practical study of the prophylactic value of pneumococcus vaccine, it is necessary to have clearly in mind the more recent advances in our knowledge of the fundamental conditions underlying the development of the disease—that is, pneumococcus infection and pneumococcus immunity. The experimental study of pneumonia in animals[1] has demonstrated the fact that the very susceptible laboratory animals develop characteristic processes only when partially immunized. The extent of the pneumonic lesion is an indication of the capacity of the tissues to react to the presence of the inciting agent. The pneumococcus is found distributed in the secretions of the upper respiratory tract quite generally, especially in patients from congested districts. It gives rise to many minor infections which undoubtedly incite some reaction of immunity.

The experimental study of pneumococcus immunity and the action of homologous immune serums[2] has distinguished two fundamental factors in pneumococcus infection, the action of the pneumococcus poison on the one hand, and, on the other, its parasitic adaptation. Recovery follows the neutralization of the poison by the immune serum or the development of the pneumococcus immune reaction in the tissues. The pneumococcus cells are usually destroyed promptly either by lysis or by phagocytosis, but they may survive after recovery and even in the immune animal. The study of pneumococcus infection in a highly immunized horse[3] demonstrated that these pneumococcus cells may not only survive, but may give rise to extensive processes despite the fact that the blood serum of such an animal exercises a high degree of protective action on pneumococcus infection when tested by standard methods.

In the light of this knowledge of pneumococcus infection and of pneumococcus immunity, the value of pneumococcus vaccine in the prevention of pneumonia ought to be very clearly demonstrated before favorable claims are accepted. Following the favorable reports of Lister[4] in South Africa and of Cecil and Vaughan[5] in this country, a careful study was made[6] of the degree of protection against virulent pneumococcus infection afforded by different doses of vaccine in susceptible animals, in which the degree of protection could be more accurately measured than in the partially immunized or less susceptible animals. With the dosage of vaccine ordinarily used, and even with larger doses, the degree of protection was slight or even indeterminate. It was only with much larger doses that definite protection was obtained. Apparently the extremely virulent pneumococci which were used in the experiment grew in immune animals just as they grow in immune serum in the test tube.

In the recent study of inoculation by von Sholly and Park,[7] favorable results are claimed, but the number of cases of pneumonia is frankly acknowledged to be too small to be of significance.

It thus appears that pneumonia, as it develops in man, occurs under conditions in which the susceptibility of the host and the virulence of the invading parasite are fairly evenly balanced, and that, in the majority of cases, the reaction of the tissues brings about a spontaneous recovery which is complete—in fact, a crisis in more than one-half the cases. The mortality varies greatly, ranging from less than 10 to more than 40 per cent. It is quite conceivable that preventive inoculation with pneumococcus vaccine might give rise to sufficient immunity to protect some, if not all, persons for a short time and under special conditions of exposure, but the fact that inoculation does afford material protection should be clearly demonstrated before it is advocated generally. It was for this purpose that the present study in New York State institutions was made.

RESULTS OF OBSERVATIONS

The period of observation for purposes of comparison not only extended through the winter months of 1919 and 1920, but included also the winter months of 1920 and 1921 into April. There are, therefore, two seasons of prevalence of pneumonia recorded, the first one immediately following the inoculation, and the other more than a year later.

The vaccine used was the lipovaccine prepared at the Army Medical School in Washington, D. C., containing approximately ten billion each of Types I, II and III pneumococci in each dose. A single dose of 1 c.c. was administered subcutaneously.

The institutions represented a population of 38,958 inmates. During the period of observation, three groups were maintained: Group 1, inoculated; Group 2, control, in the hospital at the time of inoculation but not inoculated; Group 3, new admissions to the hospital after the date of inoculation and not inoculated. The first half of the alphabetical list of patients in each ward was arbitrarily selected as Group 1 and inoculated. The only patients omitted were a comparatively small number who had fever, and a few others for special reasons.

The only wards omitted were two admission wards in diphtheria quarantine and one admission ward undergoing typhoid inoculation. Wards of chronic bed patients, the tuberculosis and acute wards, and the working wards and farm cottage groups were included. Patients admitted to the hospital after the date of inoculation were put in a third group, because of the high pneumonia and total death rate among them.

As the patients were inoculated, their names were checked accurately, and immediately after the inocula-

1. Wadsworth, Augustus: Experimental Studies on the Etiology of Acute Pneumonitis, Am. J. M. Sc., May, 1904.
2. Wadsworth, Augustus: Studies on Pneumococcus Infection in Animals: Action of Immune Sera on Pneumococcus Infection, J. Exper. Med. **16**: 78, 1912.
3. Wadsworth, Augustus: A Study of the Endocardial Lesions Developing During Pneumococcus Infection in Horses, J. M. Res. **39**: 279 (Jan.) 1919.
4. Lister, F. S.: An Experimental Study of Prophylactic Inoculation Against Pneumococcal Infection in Rabbits and in Man, South African Institute for Medical Research Papers **8**, 1916.
5. Cecil, R. L., and Vaughan, H. F.: Prophylactic Vaccination Against Pneumonia at Camp Wheeler, J. Exper. Med. **29**: 457 (May) 1919.
6. Wadsworth, Augustus: The Protective Value of Pneumococcus Vaccination in Mice and Rabbits, J. Immunol. **5**: 429 (Sept.) 1920.
7. Von Sholly, A. I., and Park, W. H.: Report on the Prophylactic Vaccination of 1,536 Persons Against Acute Respiratory Diseases, 1919-1920, J. Immunol. **6**: 103 (Jan.) 1921.

tion a card index for each group was made at each hospital from the original list. When patients were transferred from one hospital to another, their cards were also transferred. Every case in which a clinical or necropsy diagnosis was made was recorded, but no distinction was made in the tabulations between the forms of pneumonia, because pneumococci have been so frequently found in both the bronchial and lobar

INCIDENCE OF PNEUMONIA AND RESULTS OF EXAMINATION OF SPECIMENS FOR TYPE DIAGNOSIS IN NEW YORK STATE INSTITUTIONS, FEBRUARY, 1919, TO MAY 1, 1920

Group	I Inoculated	II Control Uninoculated	III New Admissions Uninoculated
Total number in group	17,752	18,595	7,922
Total number of cases of pneumonia*	253	340	320
Number of cases of pneumonia from which specimens were secured	122	186	103
Specimens secured:			
Sputum	55	92	46
Lung tissue	71	81	40
Blood culture	23	25	12
Spleen	16	14	5
Throat swab	15	25	20
Pus	3	0	0
Urine	0	1	1
Total	183	238	124
Distribution of organisms isolated:			
Pneumococcus Type I	1	3	6
Pneumococcus Type II	2	5	1
Pneumococcus Type II A	3	3	0
Pneumococcus Type III	16	33	16
Pneumococcus Group IV	33	54	32
Total of all types	55	98	55
Hemolytic streptococcus	17	27	13
Nonhemolytic streptococcus	58	66	28
Friedlander's bacillus	14	9	6
B. tuberculosis	2	1	0
B. coli	4	9	3
B. influenzae	1	4	1
B. pyocyaneus	1	0	0
M. tetragenus	2	3	0
Staphylococcus	25	25	26
Contaminated and negative	26	34	17

* To April 1, 1920.

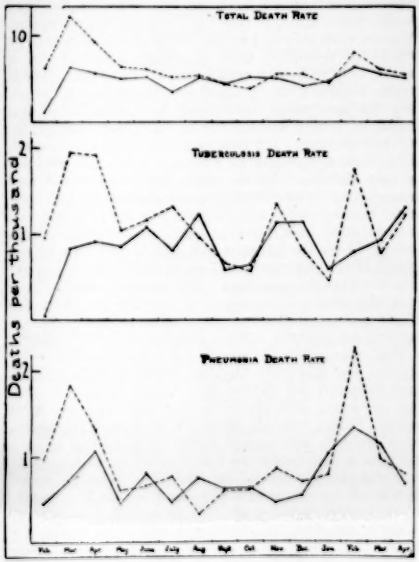
pneumonias and because many were of the terminal type in debilitated patients. Comparatively few cases of typical lobar pneumonia came under observation. All pneumonia and other deaths and all discharges were tabulated and reported by months for each group. Practically an equal number of patients was discharged from the hospitals from each group.

In order to determine the type of pneumococcus infection, specimens from cases of pneumonia were sent to the laboratory in Albany or to that in New York, where careful analyses were made. At one of the larger institutions, the Willard State Hospital, a member of the staff of the laboratory in Albany was assigned to this work in October, 1919, so that examination of specimens might be carried out without delay. In the examination of all these specimens the most reliable method, that of inoculating a mouse, was used. In addition, the cultural method of Avery and the precipitin test of Krumwiede were used with some of the specimens.

The total death rate, and the death rates from tuberculosis and from pneumonia in both the inoculated and the control uninoculated groups are given in the accompanying chart by months.

An extremely small number of Type I pneumonias was observed; in fact, the usual percentages of Types I, II and III pneumonias in these groups of inmates were completely reversed from what is ordinarily observed in the hospital pneumonias, probably owing to the large number of so-called terminal pneumonias. The incidence of pneumonia and the results of the laboratory examination of the specimens are shown in the table.

As indicated in the chart, the death rate from pneumonia in the inoculated appears to be much below that in the control group, but the same is true of the total death rate. This lower death rate from pneumonia in the inoculated group might account to some extent for the discrepancy in the total death rate were it not for the fact that the tuberculosis death rate in the two groups shows an even greater discrepancy than the pneumonia death rate. These figures indicate that there was some selective action in the division of the population into two groups. Although those who had fever at the time of inoculation and were therefore omitted were comparatively few, they probably account to a considerable extent for the higher total and tuberculosis death rates in the control group. If the proportion of the total death rate due to death from pneumonia in the inoculated and uninoculated groups is figured, the percentage of deaths due to pneumonia in these two groups is practically the same, 14.5 per cent. in the inoculated and 14.8 per cent. in the uninoculated.



Total death rate and tuberculosis and pneumonia death rates: solid line, inoculated; broken line, uninoculated control.

The results are far from satisfactory and do not permit us to draw from them any definite conclusions. Nevertheless, they do show that a relatively large number, if not proportionately an equal number, of cases of pneumonia developed after inoculation. Furthermore, they show the development, in the inoculated group, of pneumonias incited by the three fixed types of pneumococcus used in the vaccine.

THE ROENTGEN RAY IN TONSILLAR DISEASE *

FRANCIS L. LEDERER, M.D.
CHICAGO

In response to numerous inquiries as to the efficiency of roentgen-ray therapy in tonsillar disease which have come to this clinic within the last year, we submit a preliminary report as to facts.

The cases which we undertook to treat were those representing every type of tonsillar disease and in patients of varying ages. Each case was treated by the accepted methods of roentgen-ray dosage and technic, controlled by the laryngologist in collaboration with the roentgenologist, and also by bacteriologic, blood and other laboratory methods. It must be remembered that the time element is an important factor, and therefore no case can be reported as a cure or failure unless a certain time has been allowed to elapse. Furthermore, there must be some understanding as to what can be considered a cure, either the loss of the tonsillar struma, or the alleviation of clinical symptoms both subjectively and objectively, or both.

In no case in our series have we observed any very marked changes, and only in children with the typical hypertrophied tonsils have we been able, by the very closest observation, to note even a slight change in size. Patients with infected tonsils with the usual recurrent attacks of tonsillitis were seemingly benefited for a period, only to have a recurrence of the attack. These cryptic tonsils, with the usual infectious material which they harbor, were controlled bacteriologically and found, as is well known, not to have been affected by the roentgen ray. The type of tonsil which has through disease and age undergone a fibrosis is but little affected by this therapy. Those cases which presented any urgent clinical manifestations producing marked systemic reaction were not subjected to the roentgen ray because such conditions as rheumatism, endocarditis and nephritis would gain too firm a foothold in the course of the treatment, and we did not wish to jeopardize the life of the patient. Encouraging results have been obtained not so much objectively as from the alleviation of subjective symptoms, in that type of child whose pharynx is filled with lymphoid hyperplasia.

The roentenologic work was done entirely by experts, Dr. Benjamin Orndoff and his associates, who have followed the technic well known to men in this line of work, and therefore we omit any technical details. Suffice it to say, however, that every laryngologist should be well versed in the technic so as to give the patient the necessary information as to length of time and possible cost of the treatment. With the cooperation of the roentgenologist, we have made arrangements so that, in the event that the roentgen ray proved finally to be of no benefit, the patient might not be the loser when operation is resorted to; this applies only during the period of our investigation. In other words, the expense of the treatment is about equivalent to the charge for operation in the poorer middle class. This method of procedure has enabled us to obtain material for the proper study of the question. It is our intention to make an exhaustive report when sufficient material is secured and a long enough time has elapsed to warrant a fair statement. This preliminary report is made, as was said before, because we are besieged by inquiries, and because we hope that all laryngologists will give this method of treatment a fair trial. Thereby the procedure may be given its place according to its efficiency as a type or therapy, and not appear with extravagant claims from some roentgenologist or belittled by a biased laryngologist who condemns the treatment without sufficient proof of its failure. The greatest danger lies in the pretension of treating a serious condition of tonsil or adenoid disease by imperfect roentgen-ray or inefficient clinical control: almost any patient might be immediately subjected to the indiscriminate use of the roentgen ray. We have seen some patients that have been treated by this method in other clinics with resultant extreme dryness of the throat, which has persisted. The procedure, therefore, is not without some danger. Furthermore, there is the negative side, that is, negative results as they compare with the results of a carefully carried out operation when real indications are found for the removal of tonsils.

2551 North Clark Street.

* From the Clinic of Drs. Joseph C. Beck and Harry L. Pollock, North Chicago Hospital.

CULTIVATION OF TRICHOMONAS

AND THE QUESTION OF DIFFERENTIATION OF THE FLAGELLATES *

KENNETH M. LYNCH, M.D.
DALLAS, TEXAS

Barring a limited number of special workers, the conception of the whole of the medical profession is probably confused no more by any question than that of the intestinal protozoa. That when a physician receives a report of the presence of any of these organisms, all sorts of symptoms and conditions are attached to this fact, and it is made the basis of diagnosis and treatment of the sick, is a point of wide application. The particular importance of this fact lies in the likelihood of such a finding confusing the issue and leading away from some other existing condition.

The recent war is responsible for exciting interest in, and spreading misinterpreted information about, intestinal protozoa. It stimulated the examination of feces to a much wider practice than existed before, and so intestinal protozoa are much more commonly encountered. One cannot even estimate the number of laboratory technicians who are responsible for all sorts of examinations employed by practicing physicians, very few of whom can differentiate between *Endameba histolytica* and *E. coli*, or between the several flagellates; and yet one has only to visit the offices of practicing physicians to obtain an idea that there are hundreds, if not thousands, of such people, who actually have the whole responsibility of such examinations. It is probably not far wide of the mark to say that the average laboratory worker knows only two terms applied to intestinal protozoa: ameba and trichomonas; and the mere presence of either is considered sufficient evidence of its parasitism.

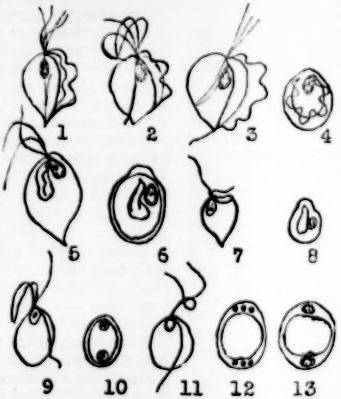
Of course, there is only one reason for this state of affairs—ignorance and confused information in the medical profession, and among laboratory people in particular. That this exists widely is perfectly evident from the attention given discussions of the subject,

* From the Medical and Surgical Clinic, Dallas.
* Read before the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

particularly before local or regional medical societies. Intestinal protozoa have been and are being blamed for every sort of human ailment. Physicians are energetically treating "amebiasis," when only harmless *Endameba coli* is present, and "flagellate infection," when *"Trichomonas"* is found; and one instance comes to mind in which a considerable number of cases of *Balantidium* infection—the *"Balantidium"* probably being some flagellate—have been reported from his private practice by a physician in a small town.

There is little excuse at the present time for confusing harmless *Endameba coli* with *Endameba histolytica*, or *Balantidium* with any intestinal organism; but, from the reading matter available to the general profession, there is little wonder that the status of the flagellates is confusing.

In order that judgment of the flagellates may be put on a rational basis, we may as well discard the bulk of medical literature of this country on the subject, especially when inaccurate identification of the organism is involved, since one cannot be certain which protozoon was dealt with. Even now, there is no general distinction made between *Trichomonas* and *Chilomastix*, and undoubtedly a large part of our literature concerns the latter instead of *Trichomonas*. It cannot be clear to the average person who is interested in the question whether there are one or more trichomonads in the intestine, or whether the *Trichomonas* of the vagina, mouth and intestine is one or different organisms; and that most common intestinal cell, *Blastocystis*, is not a *Trichomonas* or some other cyst. If we are to settle satisfactorily the clinical significance of *Trichomonas*, we must first be able to know it. Those who would determine the importance of the flagellates as a whole forget the history of the amebas and would not profit by its lessons. The terms "flagellosis" and "flagellate infection" have no meaning at the present time beyond the presence of flagellates.



1, Trichomonas hominis; 2, Trichomonas vaginalis; 3, Trichomonas caviae; 4, Trichomonas caviae cyst; 5, Chilomastix mesnili; 6, Chilomastix cyst; 7, Embadomonas intestinalis, according to Dobell; 8, Embadomonas cyst, according to Dobell; 9, Tricercomonas intestinalis; 10, Tricercomonas cyst with two nuclei, according to Dobell; 11, Enteromonas caviae n. sp.; 12 and 13, Blastocystis.

Trichomonas is a common inhabitant of the large intestine, vagina and mouth. It is encountered very often in feces from normal persons. Whenever it is present where there is diarrhea and a liquid stool, it may be prolific and show in enormous numbers in the feces. Particularly is this the case when intestinal exudation occurs, probably because it grows very well in such a medium even under artificial conditions. Consequently, it is but natural that its presence is coupled with intestinal inflammation. That it is concerned with the production of inflammation, there exists only circumstantial evidence. It has been seen within the tissues of the intestine without evidence of exciting a reaction there; and whether it entered before or after death of the host cannot be said. It has been reported from parts of the body which it may have reached through the blood stream. It has been reported to contain red blood cells, and this has been taken as evidence of its pathogenicity. Clinical reports appear commonly in which "flagellate dysentery" has disappeared under treatment, with the apparent disappearance of the flagellate. On the other hand, although one does not see it often reported, numerous instances are at hand in which *Trichomonas* was present in diarrhea and remained after the diarrhea subsided, with or without treatment. Other instances are at hand in which the intestinal condition ascribed to it remained after *Trichomonas* could no longer be found. Then, again, a number of cases of "cure" of *Trichomonas* infection have been encountered in which the person still harbored *Trichomonas*. I have under observation several hosts of *Trichomonas* as well as *Chilomastix* who have shown the organism on repeated examination for several years, one for as long as nine years, and who have never experienced any disturbance from it; and in routine laboratory work it is very common to find *Trichomonas* in the feces of people who can give no reference to any ill effects from it. When such a large proportion of people harbor any organism, it is inevitable that it may be associated with some disease condition in a considerable proportion.

From time to time, experimenters have reported transmission of *Trichomonas*, with apparent infection. None of these experiments can be called conclusive. I realized this after reporting such experiments. It is virtually impossible to select animals not already harboring trichomonads; and, even if it were possible, no reliance can be placed on results obtained from material or cultures containing bacteria.

Trichomonas in the vagina is commonly associated with the occurrence of leukorrhea, and in the mouth it grows in the material and exudates around the teeth and gums, in inflammation. In my observation, it has disappeared with the clearing up of these excellent mediums for its growth, and it may have no further significance.

CULTIVATION

Trichomonas was first cultivated in beef broth (Lynch [1]). Since that time, Ohira and Noguchi [2] have reported obtaining cultures of *Trichomonas* from the mouth in equal parts of ascitic fluid and Ringer's solution. Boyd [3] obtained a growth of *Trichomonas hominis* in a mixture of feces and physiologic sodium chlorid solution. Pringault [4] cultured *Trichomonas hominis*

1. Lynch, K. M.: Trichomoniasis of the Vagina and Mouth, Am. J. Trop. Dis. **2**: 627, 1915; Clinical and Experimental Trichomoniasis of the Intestine, New York M. J., May 1, 1915.
2. Ohira, T., and Noguchi, H.: The Cultivation of Trichomonas of the Human Mouth (Tetratrichomonas hominis), J. Exper. Med. **25**: 341 (Feb.) 1917.
3. Boyd, M. F.: A Note on the Cultivation of Trichomonas Intestinalis, J. Parasitology **4**: 168 (June) 1918.
4. Pringault, E.: Étude biologique die Trichomonas intestinalis, Bull. de la Soc. Path. Exot. **13**, 1920.

in Ohira and Noguchi's medium; Reufing[5] *Trichomonas vaginalis* in the same solution, and Hogue[6] *Trichomonas hominis* in a medium of egg albumin and Locke's solution. I have cultivated *Trichomonas* from the feces, vagina, mouth and urine (*Trichomonas* of vaginal origin) in a number of solutions,[7] including liquid blood serum, ascitic fluid, pleural fluid and ovarian cyst fluid, diluted from 1:4 to 1:10 with from 0.5 to 0.9 per cent. sodium chlorid solution, or with Ringer's or Locke's solution. Blood serum diluted with ten volumes of 0.5 per cent. sodium chlorid solution has been found fairly uniformly good. *Trichomonas* grows well at 37 C., at the bottom of a fairly long column of medium, and is best removed with a capillary pipet. Growth is usually progressive, and division of the organism may be followed for about four days, during which time swarms of organisms may be produced. After this period, the number decreases, and the flagellates usually disappear in a few days.

DIFFERENTIATION OF SPECIES AND OTHER ORGANISMS

At present, *Trichomonas hominis* (from the intestine), *Trichomonas vaginalis* (from the vagina) and *Trichomonas buccalis* (from the mouth) are generally considered to be distinct species. At least, they have not been certainly identified as the same. They present in common four anterior flagella arising from the blepharoplast on the anterior end, from which also come the basal rod and free margin of the undulating membrane, which runs diagonally backward, and the axostyle or stiff skeletal support. The nucleus, lying near the anterior end, is ovoid, composed of a compact chromatin mass in the nondividing forms, of loose chromatin network preliminary to mitosis and showing mitosis in division. There is some debate about the constancy of four anterior flagella for the genus, some describing three and some five. In my exeperience, four is the correct number, although not all may be seen, and more are often encountered in division. Occasionally, one with five is seen, but this fact may not be used as a feature for separating the genus in any thus far encountered in this study. There have been a number of accounts of a five-flagellated trichomonad (*Pentatrichomonas*), which consumes red blood corpuscles. Possibly, this is a distinct organism, and it should be watched for closely on account of its suggested pathogenic significance. I have not encountered a form of *Trichomonas* from man which did not show fairly constantly four flagella, when properly studied.

In direct preparations, there often seems to be differences betwen the trichomonas of the vagina, mouth and intestine. That of the vagina frequently averages larger in size and is often less active in swimming about. Frequently, the undulating membrane is shorter and more delicate. Yet these features also occur among the organisms from one source. It has been impossible thus far to differentiate with certainty the trichomonads from the intestine, vagina and mouth, in culture in the same material. It appears, therefore, that, under the same conditions, they are identical. At any rate, if they are distinct, the differentiating feature has yet to be developed and will have to apply to organisms cultivated under the same environment.

As to the relation of human trichomonads to those of other animals, at least some of the latter appear to be distinctly different. *Trichomonas* of the mouse, guinea-pig, and frog all have three flagella. *Trichomonas caviae*, which, following Kofoid[8] is now properly called *Tritrichomonas caviae*, has a distinct encystment, the cyst showing nucleus, blepharoplast, undulating membrane, basal rod and chromatinic margin and axostyle, but no flagella. Its undulating membrane is much heavier; the nucleus is different, and it has not grown with the facility of *Trichomonas* of man in the same culture mediums. Dobell has described a cyst for *Trichomonas* (*Tritrichomonas*) *batrachorum*, and Wenyon a cyst for *Trichomonas* (*Tritrichomonas*) *muris*, while no reported cyst of *Trichomonas* of man has stood the test of critical investigation. There is as yet no proof of a carrier of *Trichomonas* of man among other animals.

A cell frequently called *Trichomonas* cyst is *Blastocystis*, probably related to *Ascomycetes*, a very common cell in the intestine, which has been differentiated for some time by careful observers and recently cultivated by Barret[9] and Lynch.[7]

The organism most commonly confused with active *Trichomonas* is *Chilomastix mesnili*, *Chilomastix davainei* according to Kofoid,[8] and yet it is so distinct that one wonders that the confusion existed even with the best students for so long. *Chilomastix* has three flagella anteriorly directed, a distinct and heavily outlined cytostome or mouth and no undulating membrane save a very delicate flagellar organ within the cytostome. It is frequently spirally twisted, and swims in a distinct spiral without the flexibility of *Trichomonas*. In addition, it has a characteristic lemon-shaped cyst, containing the organism with its distinctive cytostome, first described by Lynch[10] who mistook it for *Trichomonas*.

In addition, there are two or more comparatively rare flagellates of the human intestine which may be confused with *Trichomonas* by those uninformed about them. These are *Tricercomonas intestinalis*, *Enteromonas hominis* and *Embadomonas intestinalis*. They are about half the size of *Trichomonas* and have no undulating membrane. *Enteromonas hominis*, according to da Fonesca,[11] possesses three anterior flagella, two directed forward and one back over the body but not adherent. No cyst has been reported for it. *Tricercomonas intestinalis* is described by Wenyon and O'Connor[12] with four anterior flagella, three directed forward, the fourth recurrent and adherent to the surface of the body for a part of its length. Dobell[13] thinks these two flagellates are the same. In my experience, *Tricercomonas* of Wenyon and O'Connor is present in this country, and, although *Enteromonas* of da Fonseca has not been seen, a flagellate conforming to his description found in the guinea-pig confirms the existence of the genus and its possible occurrence

5. Reufing, F.: Zur morphologie von Trichomonas vaginalis Donne, Arch. f. Protistenk. **17**: 347, 1921.

6. Hogue, M. J.: The Cultivation of Trichomonas Hominis, Am. J. Trop. Med. **1**: 211 (July) 1921.

7. Lynch, K. M.: Blastocystis in Culture, Am. J. Trop. Med., to be published; Cultivation of Trichomonas from the Human Mouth, Vagina, and from Urine, Am. J. Trop. Med., to be published.

8. Kofoid, C. A.: A Critical Review of the Nomenclature of Human Intestinal Flagellates, Cercomonas, Chilomastix, Tetratrichomonas and Giardia, Univ. of California Pub. in Zool. **20**: 145, 1920.

9. Barret, H. P.: A Method for the Cultivation of Blastocystis, Ann. Trop. M. & Parasitol. **15**: 113 (July) 1921.

10. Lynch, K. M.: Dauercystformation of Trichomonas Intestinalis, J. Parasitology **3**: 28 (Sept.) 1916.

11. Da Fonseca, O. O. R.: Sobre os flagellados dos mamiferos do Brazil: um novo parasito do homem, Brazil-Med. **29**: 281, 1915.

12. Wenyon, C. M., and O'Connor, F. W.: Human Intestinal Protozoa in the Near East, London, 1919.

13. Dobell, Clifford: The Intestinal Protozoa of Man, Dobell and O'Connor, New York, 1921.

in man. *Embadomonas intestinalis* has two unequal anterior flagella, a comparatively large anterior cytostome and a cyst resembling that of *Chilomastix*, except that it is much smaller. Possibly *Embadomonas* may be confused with *Chilomastix*, although it is less than half the size, its jerky movements differ from the spiral of *Chilomastix* and its flagella differ in number and action.

STUDY OF SPECIMENS

A careful study of unstained material will serve to differentiate *Trichomonas* from any other organism. When fresh and active, the flagellar movements and undulating membrane are characteristic. After exposure and cooling, it loses the action of these parts and assumes a peculiar ameboid undulating form in which protoplasmic waves of broad and blunt or long and finger-like proportions progress, with diminishing size from anterior to posterior end. This is also characteristic. When it becomes a question of determining the number of flagella, for the possible dividing of the genus, the most careful staining is necessary. These fine structures may not be counted with certainty on the active cell, and the staining must be sufficient to allow correct observation of a large number of organisms and to differentiate those undergoing division. The usual process depended on for this differentiation is the iron-hematoxylon method. When properly applied, this staining is usually satisfactory, but it has not served so well with spreads from cultures, probably on account of the albumin to be coagulated in the mediums. Excellent results have been obtained in differentiating the flagella and undulating membrane by careful staining of thin films from cultures by Wright's blood stain.

SUMMARY

1. *Trichomonas* is a widely and highly prevalent inhabitant of the body of man and is being extensively treated as a pathogenic organism.

2. There exists only circumstantial evidence of any harmful effects from it or even of its true parasitism. The ease with which it may be grown artificially, its feeding habits, its high prevalence in the healthy and its long continuance without resulting disturbance in the human body indicate it as a harmless commensal.

3. For a proper judgment of the clinical significance of *Trichomonas*, the organism must first be accurately differentiated from others now confused with it, and, if there are different organisms now included in the genus, they must be separated.

4. *Trichomonas* must be studied under the same conditions before they may be differentiated. This would appear to be best done in culture in the same mediums.

5. In culture in the same material, trichomonads from the human mouth, vagina and intestine have not been certainly differentiated in this study.

6. There exists no proof that trichomonads of other animals are identical with those of man, and at least some of them are certainly distinct.

ABSTRACT OF DISCUSSION

DR. JOHN A. KOLMER, Philadelphia: Did the parasites undergo any morphologic changes differing from the appearance as found in the mouth?

DR. KENNETH M. LYNCH, Dallas, Texas: There are no changes in cultures from the characteristic morphology in the direct preparation. Of course, the multiplying forms are much more easily studied.

CHINA AS A FIELD FOR THE STUDY OF THE NUTRITION OF HUMAN TEETH *

J. F. McCLENDON, PH.D.
MINNEAPOLIS

According to Pickerill,[1] bad teeth are the curse of civilization. He gives figures to show that dental caries increased in the Britons from the stone age to the bronze age, and from the bronze age to the Roman occupation, and in the Angles and Saxons after they came to England and among the English, so that in modern times about 95 per cent. of them have carious teeth. He also states that the same process took place but far more rapidly among the Maori of New Zealand, and that 95 per cent. of the Maori schoolchildren in the English schools have carious teeth. He places the Chinese among those races with little dental caries. We should remember, however, that while our ancestors led a barbaric life in the forests and swamps of northern Europe and had no agriculture, the Chinese had developed a thickly populated and comparatively civilized community. The central plateau of Asia is considered the "cradle of the human race," and the beginnings of Chinese civilization are lost in antiquity.

We cannot take up the various factors of civilization and their effect on the teeth, but animal experimentation has shown that the chief factor in the well-being of the bones and teeth is diet. I will consider the Chinese civilization from a dietetic standpoint. The origin of domesticated plants is somewhat doubtful, but the emperor Chin-nung, 2800 B. C., ordered a ceremonial in which certain seeds were sown; and by this time and in a few succeeding centuries, but long before our ancestors took up agriculture, the Chinese had domesticated, or obtained from their neighbors chiefly to the south, quite a number of plants. Among these are the radish, Chinese yam, Chinese cabbage, tea, sugar-cane, orange, mandarin orange, jujube, Chinese plums, apricot, peach, kaki (persimmon), date plum (persimmon), Chinese pear, banana, litchi (nut), buckwheat, soy bean, wheat, Italian millet and rice. The Chinese diet is classed by McCollum as a complete vegetarian diet, supplying in sufficient quantity everything needed in nutrition.

As to the special nutrition of the teeth, it has been found that the teeth require all those food elements needed by the body as a whole and in addition the elements giving it its hardness, chiefly calcium, fluorin and the phosphate ion. In other words, as Gautier has shown, the enamel of the teeth has nearly the same composition as crystalline phosphate rock or apatite, $CaFCa_4(PO_4)_3$. Magnesium is present to a small extent, and it may be considered to replace calcium as an impurity, or as in the case of the formation of dolomite from limestone. The same elements, with the addition of calcium carbonate and white fibrous connective tissue (collagen), constitute the dentin. When we consider all the articles of diet of a people, the complexity is so great as to prevent any headway with the problem. I[2] have shown that the North American Indians used at least 660 species of plants for food, drink and medicine.

* From the Laboratory of Physiological Chemistry, University of Minnesota Medical School.

1. Pickerill: The Prevention of Dental Caries and Oral Sepsis, Philadelphia, 1914.

2. McClendon, J. F.: Some American Plants Considered as Sources of Vitamines and as Parts of a Diet Favorable to the Preservation of the Teeth, J. Dental Res. 3:279, 1921.

But animal experiments have cleared the way for the study of effective diet on human teeth. It seemed necessary first to know the calcium and phosphate content of the mixed diet.

CHANGES IN BONES FROM DEFICIENT DIET

The metabolism of bones and teeth is similar, and the changes in the bones due to deficient diet are of two main types: first, rickets due to deficiency of phosphate. The growing areas of bone fail to calcify, but there is an overgrowth of soft bone matrix or osteoid tissue. The teeth are late in developing, and the enamel is thin and soft. I have shown that any substances that increase growth increase the severity of rickets. In fact, the growth multiplied by a constant equals the phosphorus retention in a normal animal; and if the growth multiplied by a constant minus the phosphorus retention is a positive quantity, rickets is present. In this case I refer chiefly to growth of the skeleton, and some errors may arise, owing to the fact that the skeleton may grow while the body as a whole fails to grow. But even with this inaccuracy I am able by means of this formula to classify the experimental rats into rachitic and nonrachitic as accurately as by any other known method. When young rats fail to grow, 0.13 per cent. of phosphorus in the diet is sufficient to prevent rickets; but when they grow at the normal rate, 0.45 per cent. is required. In fact, 0.6 per cent. is the usual amount in the normal diet. Thyroxin, exercise, burning with ultraviolet light and perhaps exposure to cold and some other agencies increase the metabolism and phosphorus intake at a given growth rate and in this way tend to prevent rickets. Cod liver oil in some way increases the phosphorus retention.

In contradistinction to phosphate starvation, calcium starvation produces osteoporosis or light weight bones without any gross rachitic lesions at the epiphysis. Osteoporosis can hardly be considered a specific result of calcium starvation, however, as it occurs in scurvy and beriberi in cases in which there was no intention, at any rate, of producing calcium starvation. The teeth tend to follow the bones in their development, but osteoporosis in the older animals does not necessarily mean just lighter weight teeth. In scurvy, for instance, we have an osteoporosis of the bones, but in the teeth an increase in the activity of odontoblast cells occurs with the formation of irregular osteodentin.[3]

With the diets of human beings it is difficult to say whether calcium or phosphate is most often deficient. A diet of meat and graham bread contains sufficient phosphate, but is deficient in calcium. Phosphate occurs in the leaves of plants which also contain much calcium. Both the calcium and phosphate occur in cow's milk in sufficient amount for nutrition, but milled cereals are deficient both in calcium and in phosphate. In fact, the excessive use of milled cereals, including polished rice, patent flour, corn meal, cream of wheat, and to a less degree, rolled oats, is perhaps responsible for the greatest shortage of calcium phosphate in our diet. I have shown that rats fed graham flour are normal, whereas control rats fed the same diet with the substitution of patent for graham flour are rachitic. Modern milling of cereals has been developed during centuries with the white man, but has been partially introduced into China only during the last ten years, although patent flour has been imported for a longer period. In fact, the process of introduction is still in progress. It would seem, therefore, that this one question in nutrition of the teeth as to the effect of the milling of cereals could be studied in China during the succeeding years very effectively.

To sum up, calcium phosphate and the vitamins A, B and C (including the antirachitic vitamin) seem all concerned with the well-being of the bones and the teeth, and it would be desirable to study the concentration of these substances in the primitive Chinese diet and in diets as changed by the introduction of modern milling machinery and other causes. The estimation of calcium in the diet is an easy matter, but the estimation of vitamins is more difficult in quantitative work; and although we may suppose that there are enough vitamins in ordinary foodstuffs to prevent there ever being a shortage, some vitamins are of a perishable nature and they may be destroyed before they reach the consumer. It is rather notable that we get from the Chinese two fruits which contain the most perishable vitamin C in large amount and in which it will withstand high temperatures and drying. These are the orange and the peach; and though there may be some dispute as to their origin, de Candolle[4] has brought strong evidence that they originated in China. The Chinese dry peaches by ordinary methods, and oranges with the addition of sugar. Perhaps dried peaches are found in all countries where the peach is grown.

INFLUENCE OF FOOD ON HISTORY

The history of mankind is largely influenced by food. That is to say, lack of food has been about the most serious catastrophe. If we compare the activities toward colonization as carried out by two peoples and try to correlate this with their food, we may arrive at some interesting speculations. The Vikings were among the boldest sailors of history. Norse sailors visited Iceland and Greenland. Lief Erickson discovered America about 1000 A. D. Some years later Thorfin Karlsefini brought three ships with 160 persons to America. Norse visits to America were occasionally repeated until 1746, and yet these bold seamen were unable to establish sufficient communication with the mother country to keep a colony alive in America. An illuminating commentary on this state of affairs is contained in the fact that it was not until 1910 that Holst and Frölich discovered that the chief sickness among Norwegian seamen was due to the lack of vitamin C in their diet. We do not know of any food in possession of these Norwegian seamen that could be kept for long periods except in fresh or frozen condition without losing its vitamin C.

On the contrary, people of southern Europe had obtained the orange and the peach, and were in possession of two foods in which vitamin C could be stored for long periods. Compare the dismal failure of Norwegian colonization of America with the brilliant success of the Spaniards. Norwegian mariners, by stopping at Iceland and Greenland, divided the voyage into three relatively short trips. Columbus had to strike out across the Atlantic, and yet he was more successful. It is true that Magellan's ships in sailing around the world did not carry enough of this vitamin C. In fact, only one of them was able to make the voyage; but the success of Magellan was certainly far greater than that of the Norwegians. These Spaniards brought the peach and the orange to America, and

3. Robb, Medes, McClendon, Graham and Murphy: Study of Scurvy and Its Bearing on the Preservation of Teeth, J. Dental Res. 3:39, 1921.

4. De Candolle, Alphonse: Origin of Cultivated Plants, London, 1884.

these fruits have probably had a good deal to do with the rapidity of extension of colonies where the storage of food was made necessary by long ocean or desert trips.

VALUE OF INORGANIC ELEMENTS IN THE DIET

Animal experiments tend to show that the effect of diet on bones and teeth can be worked out with comparative ease, and there is no reason why the same cannot be applied to human bones and teeth. Liebig overaccentuated the value of protein in the diet, and dietary studies have been mainly confined to protein, fat and carbohydrate. We do not absolutely need fat or carbohydrate in the diet at all times, because we can synthesize them from protein; but we cannot synthesize calcium, phosphorus, iodin or any of the inorganic elements—at least, not in our bodies during life. If we take the relative abundance in the body as an index of importance of elements, we find, of course, that oxygen, hydrogen and nitrogen are common to both organic and inorganic compounds; excluding these, we find that the ratio of carbon to the inorganic elements is 4:1. In other words, even on this basis we should not devote more than four times the amount of time to the organic compounds that we should spend on the inorganic in nutrition; and we include among the organic the vitamins.

Clinical Notes, Suggestions, and New Instruments

A NEW TYPE SIGMOIDOSCOPE

B. B. VINCENT LYON, M.D., AND HENRY J. BARTLE, M.D.,
PHILADELPHIA

This is simply a new type and not a new instrument. It embraces the better points of many of the old instruments, so that we have at last a practical sigmoidoscope for use in examination and treatment. The first important feature of the instrument is the diameter of the lumen. The Tuttle and the Lynch sigmoidoscopes are seven-eighths inch in diameter. Those we found too large for routine use, as the patient is often distressed by the passage of an instrument of so great a diameter, and consequently this important examination in the routine study of our patient was often not attempted at all, or abandoned after a first unsuccessful or painful examination, especially in nervous women. Dr. Horace Soper of St. Louis told us that he was using a sigmoidoscope of smaller lumen, and on endeavoring to purchase such an instrument we found that the short Axtell was the only one that had a smaller diameter in barrel. We then designed one of our own with a five-eighths inch diameter of barrel, and lighted at the distal end from the operator, thus requiring a light carrier and one of the smallest types of lamp, similar in construction to the Tuttle sigmoidoscope. This had many disadvantages in that the lamps frequently burned out or made poor contact, so that many times the light carrier would have to be withdrawn to permit readjustment of the lamp, as the light would suddenly fail us, and this alone caused us much loss of time. Furthermore, when air dilation was attempted, the fitting on the eye piece, which is usually more complicated in the light carrier type of sigmoidoscope than in the older types, allowed the escape of much of the air directly into the operator's face.

Fig. 2.—The 12 inch sigmoidoscope. In this illustration, and in Figure 1, the obturator is shown in place.

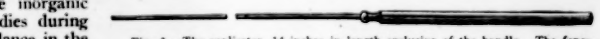


Fig. 3.—The applicator, 14 inches in length exclusive of the handle. The fenestrated spoon, the same length as the applicator, but not illustrated, can also be used for the purpose of pushing small masses of fecal material to one side as the tip of the sigmoidoscope is advanced within the sigmoid.

Fig. 4.—This powder blower has a 14 inch long delivery tube. It, too, is used in conjunction with the sigmoidoscope in making treatments to the sigmoid by insufflation.

With these difficulties to be overcome, we conferred with Mr. James Brown of the Physicians' Supply Company of Philadelphia and, with his cooperation, evolved the present instrument, by taking the lumen diameter measurements of the Axtell (five-eighths inch) and having sigmoidoscopes made running to 8, 10 and 12 inches in length. The Lynch type of illumination had been so satisfactory from the operator's standpoint that we adopted it by modifying it to this smaller barreled instrument. The result has been all that was hoped for. The illumination is perfect and always of equal distribution throughout the whole field. It is dependable, as lamps do not become easily unscrewed, thereby making imperfect contact. The lamp itself is large enough to stand fairly rough handling, compared with the smaller lamp. It does not burn out so readily, since it takes a greater voltage and does not require so fine an adjustment of the rheostat, which feature affords a great saving of time in operation. The lens, fashioned in the end of the lamp bulb, combined with the shield lens, throws a straight beam of light through the tube, which gives almost as satisfactory illumination when sent through the 12 inch as in the 10 or 8 inch sigmoidoscopes. Then, too, the lamp socket is eccentrically (peripherally) placed in the eyepiece, so that it is out of the way, and does not obstruct vision or prevent instrumentation. The whole eyepiece fits into the tube by a tapered socket or cone connection, and a glass diaphragm or window closes the eyepiece by a threaded joint. Thus no leaks can occur if one desires to use air dilation, which is

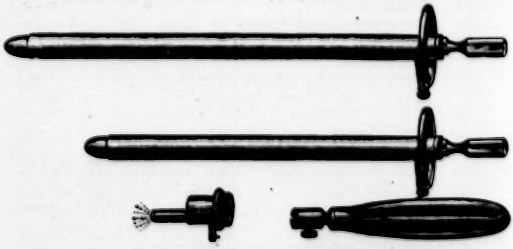


Fig. 1.—The 8 and 10 inch sigmoidoscopes; eye piece with a lensed lamp covered with its shield; glass window in place. When instrumentation is desired, the glass window is removed by unscrewing, while the lamp remains in place. The handle which is illustrated is superfluous and is not used in our work, and is provided only for those who may care to use it. The regulation type of pure rubber double bulb inflator is not illustrated here, and when used is applied to the spout of the sigmoidoscope.

rarely required during the insertion of this sigmoidoscope.

The accompanying illustrations present these features. There are shown, too, the 14 inch powder blower and applicator used in treating the sigmoid. The spoon is not illustrated, but is very much like a dull uterine curet of small size mounted as is the applicator.

Current for the lamp can be supplied from a storage or wet cell battery, or from the adjustable rheostat that can be screwed into a universal socket of the direct or alternating street current of 110 volts. We find the latter most satisfactory.

328 South Twenty-First Street—2018 Chestnut Street.

CALCULUS ANURIA

ERNST C. BAYNARD, M.D., AND JAMES J. RAVENEL, M.D.,
Professor of Urology and Lecturer in Urology, Respectively, Medical College of the State of South Carolina
CHARLESTON, S. C.

This case is reported because of its rarity and unusual interest. One does not realize how rare the phenomenon is until there is an occasion to look up the subject, on which little has been written. So far as we have been able to review the literature, textbook and journal articles do little more than describe the condition, mentioning its occurrence and giving no detailed study of the cause of this interesting but puzzling renorenal reflex set up by the presence of a calculus in the opposite kidney.

REPORT OF CASE

Mrs. S., aged 37, was admitted to Roper Hospital, Feb. 6, 1921, with a diagnosis of pyelitis complicating a pregnancy of about four months. Cystoscopic examination revealed much mucopurulent material floating freely in a very congested bladder. A No. 6 ureteral catheter was obstructed in the right ureter about 5 cm. from the bladder. This obstruction was passed with a smaller catheter, and a large quantity of pus escaped into the bladder on removal of the catheter. Roentgen-ray examination revealed a large calculus filling the right renal pelvis, and a dilated pelvis and ureter on this side. Chemical examination of the blood revealed, for each hundred cubic centimeters: nonprotein nitrogen, 30 mg.; urea nitrogen, 24.4 mg.; uric acid, 1.6 mg.; creatinin, 1.2 mg., and sugar, 75.2 mg. The urine was cloudy and acid; examination revealed four plus albumin, four plus acetone, two plus diacetic acid, no casts, four plus pus and one plus blood. The blood count revealed: leukocytes, 6,280; small lymphocytes, 6 per cent.; large lymphocytes, 3 per cent.; large mononuclears, 1 per cent.; transitionals, 0; polymorphonuclears, 89.5 per cent. The blood pressure was 105 systolic and 65 diastolic.

The patient was relieved of her symptoms by cystoscopic treatment, and left the hospital against advice. She went home and was delivered normally at full term by her private physician, Nov. 27, 1921, about three months after delivery, she was readmitted to the hospital suffering with a sharp pain in the right lumbar area posteriorly. The pain was constant and radiated down the right leg. She suffered from nausea and vomiting up to three days before admission. About five days before admission she passed a large quantity of yellowish gravel, but no blood was observed. She had passed no urine since 9 a. m., November 25, and her attending physician had been unable to obtain any on repeated catheterizations. For the last four years she had had repeated similar attacks, but had had no anuria following them. Physical examination was negative except for a palpable mass over the gallbladder area. Because of the acute pain over each kidney area, we were unable to palpate the kidneys. The patient stated that on the morning of the 28th she voided about an ounce of urine, but neither the nurse nor the intern could verify this. At 9:45 on the evening of the 28th, after an anuria of eighty-four hours with no response to drugs or local measures, and with a pulse from 112 to 124, respirations 24, and temperature ranging from normal to 101.8, and severe toxic symptoms supervening, we took her to the operating room. The blood examination at this time gave a total white count of 10,800 with polymorphonuclears 79%, per cent.

The left kidney was cut down on and found to be blue-black, and very tense within its capsule. When the capsule was incised, the kidney popped out like a pea from its pod. A nephrotomy and decapsulation was done on this side. The right kidney was exposed, a nephrotomy and decapsulation done, and a large stone, which had destroyed the greater portion of the organ, was removed from its pelvis.

After a stormy convalescence and stay in the hospital for seventy days, the patient was able to go home. She still returns periodically for treatment. Because of an infection of the left kidney and decreased function on this side, 7.5 per cent., we have been unable to remove the right kidney.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

FERRO-SAJODIN.—Ferioben.—Ferro-sajodin is a basic, ferric iodobehenate, approximate formula $Fe(OH)(C_{21}H_{43}COO)_2$, which contains at least 5 per cent. of iron and at least 24 per cent. of iodine.

Action and Uses.—Ferro-sajodin has the actions of iodides and iron. It is claimed to be more stable and palatable than ferrous iodide, not to injure the teeth or to disturb the gastrointestinal tract, and that it is free from a constipating tendency. It is claimed that ferro-sajodin is easily absorbed, but that it is slowly eliminated, thus assuring a more prolonged effect than that obtained from inorganic iodides and iron compounds.

Ferro-sajodin is indicated in the conditions in which iron and iodides are employed, such as anemia, rickets, syphilis, chronic bronchitis and arteriosclerosis with anemia.

Dosage.—From 0.5 to 1 Gm. (8 to 15 grains), three times daily. For children from 0.25 to 0.5 Gm. (4 to 8 grains) three times daily. Ferro-sajodin is sold in the form of tablets only. These should be masticated before swallowing or crushed when administered to children.

Manufactured by the Bayer Co., Inc., Rensselaer, N. Y. (Winthrop Chemical Co., Inc., New York, distributor). No U. S. patent. U. S. trademark 61,730.

Ferro-Sajodin Tablets, 8 grains.

Ferro-sajodin is a reddish brown, odorless and tasteless powder; unctuous to the touch; insoluble in water or alcohol; slightly soluble in chloroform, ether and warm fatty oils.

Ferro-sajodin melts to a brownish-black liquid from which iodine vapors are emitted abundantly. Shake about 0.1 Gm. of ferro-sajodin with 5 Cc. of chloroform and 3 Cc. of diluted hydrochloric acid; allow the acid liquid to separate; decant a portion of it and treat it with an excess of ammonia water. A red precipitate of ferric hydroxide is produced.

Heat about 0.5 Gm. of ferro-sajodin in a reflux apparatus for thirty minutes with 15 Cc. of a 15 per cent. solution of potassium hydroxide in methyl alcohol; cool and filter, taking care to reserve the filtrate. Treat the residue on the filter with diluted hydrochloric acid and filter. Dilute 1 Cc. of this filtrate with 10 Cc. of water and add a few drops of potassium ferrocyanide solution. A blue color results. Acidify the reserved alkaline filtrate with dilute sulphuric acid and filter. To a portion of the filtrate, add a few drops of sodium nitrite solution and shake with chloroform. The chloroform layer is colored violet.

Mix about 6 Gm. of ferro-sajodin, accurately weighed, with 10 Gm. of anhydrous sodium carbonate; place in a platinum crucible; cover with more of the anhydrous sodium carbonate, and heat slowly until the mixture is melted. Cool, dissolve in water so far as possible, filter and wash the insoluble portion with water. Dissolve the insoluble portion in warm, diluted hydrochloric acid; add 0.5 Gm. of tartaric acid; make alkaline with ammonia water, and add an excess of yellow ammonium sulphide. Allow to stand over night; collect the precipitate; wash it with dilute ammonium sulphide; dissolve it with warm, diluted hydrochloric acid; add an excess of bromine water, followed by an excess of ammonia water; collect the ferric hydroxide, dry it; heat to ferric oxide and weigh in the usual way. The weight of ferric oxide corresponds to not less than 5 per cent. of iron.

Boil for one and one-half hours in a reflux apparatus about 3 Gm. of ferro-sajodin, accurately weighed, with 120 Cc. of 15 per cent. methyl alcohol solution of potassium hydroxide; cool, add 1 Gm. of powdered animal charcoal, and wash into a 500 Cc. volumetric flask with water. Filter through a dry filter, rejecting the first portions of the filtrate; treat 250 Cc. of the filtrate with sodium acid sulphite solution; acidify with nitric acid, add 40 Cc. of tenth-normal silver nitrate, and titrate the excess of silver with tenth-normal potassium sulphocyanate. The silver nitrate consumed corresponds to at least 24 per cent. of iodine.

Special Article

THE TREATMENT OF CARBON MONOXID ASPHYXIA BY MEANS OF OXYGEN + CO_2 INHALATION

A METHOD FOR THE RAPID ELIMINATION OF CARBON MONOXID FROM THE BLOOD *

YANDELL HENDERSON, PH.D.
AND
HOWARD W. HAGGARD, M.D.
WITH THE COLLABORATION OF STUART SCOTT, M.D.
NEW HAVEN, CONN.

At a meeting of the Commission on Resuscitation from Carbon Monoxid Asphyxia on Nov. 15, 1921, the writers were appointed a subcommittee to conduct investigations both in the field and in the laboratory on the treatment of carbon monoxid asphyxia by the inhalational method, to be here described.

There is already available a considerable mass of theoretical knowledge and experimental material on which to base further advance along the line indicated. Recent investigations in this laboratory [1] have confirmed the correctness of the view that carbon monoxid has no direct toxic action on the brain, or other organs or tissues of the body, except only the blood. It acts wholly through its combination with the hemoglobin or red coloring matter of the blood. When so combined, the hemoglobin is for the time deprived of the power to transport oxygen from the lungs to the tissues of the body. A condition of asphyxia, or oxygen deprivation, therefore develops.

These investigations have also confirmed the findings of previous investigators, particularly Haldane,[2] that the combination of carbon monoxid with hemoglobin is reversible; that is, that by the mass action of oxygen the carbon monoxid which has been absorbed may be again completely displaced. The oxygen-transporting power of the blood may be thus completely restored.

The principal treatments heretofore proposed for carbon monoxid poisoning are bleeding, transfusion, artificial respiration, and oxygen inhalation. There is no adequate theoretical reason for bleeding in this condition, but rather the contrary; for it is probably injurious by further depleting the oxygen-transporting power of the blood. Transfusion of normal blood is probably quite ineffective; for in order to be beneficial, it would need to be performed within one hour, or at most two hours, after termination of the gassing; and this is in most cases quite impracticable.

Artificial respiration, preferably by the manual prone pressure or Schäfer method, sometimes plays a crucial part in resuscitation from carbon monoxid asphyxia, but on the whole is less important in this condition than in resuscitation from drowning or from electric shock. In carbon monoxid asphyxia, as in the other two conditions, artificial respiration may indeed at times be essential to start spontaneous breathing. The victim of drowning or electric shock has virtually been saved when restoration of respiration has been accomplished. The resuscitation of a man or animal asphyxiated by carbon monoxid is not so simple. Natural breathing may be restored; indeed, the victim may not have stopped breathing at all while in the gassing chamber; and yet he may die hours or days later from the effects of the asphyxia.

SLIGHT EFFECTIVENESS OF OXYGEN ALONE

Oxygen inhalation offers, therefore, the one promising line of attack on this problem. Theoretically it is the obvious method for displacing carbon monoxid from the blood and thus restoring to hemoglobin its normal capacity to carry oxygen to the brain and other organs so as to overcome asphyxia. In practice, however, oxygen inhalation has not fulfilled its theoretical promise. It needs some auxiliary agent.

This ineffectiveness of oxygen alone seems to have been due to several contributing causes, of which three may be mentioned:

1. There has been no efficient apparatus generally available for administering oxygen inhalation. When oxygen is given through a glass funnel suspended a few inches above the patient's face, very little—or none, if there is a draft in the room—reaches the patient. A well fitting mask is essential for unconscious subjects. The flow of gas should also be adjusted to the respiratory needs of the patient. Only in the so-called "self contained oxygen apparatus," [3] used for mine rescue work and employed to some extent also by city firemen and the emergency crews of gas companies, is there an apparatus at all suitable to this purpose; but such apparatus needs to be changed from a closed to an open circuit so as to avoid rebreathing, in order to suit it to the treatment of carbon monoxid asphyxiation.

2. The application of treatment by oxygen inhalation, or indeed, of any treatment in cases of gas asphyxiation, is generally too long delayed to be at all effective. Asphyxia is not immediately terminated when the victim is removed from the gassing chamber, or when the gas is turned off and the windows are opened. The carbon monoxid comes off from his blood so slowly during the first two or three hours that, although his body may be surrounded and his lungs filled with fresh air, his brain continues to be asphyxiated. On the other hand, the greater part of the carbon monoxid comes off in the course of four or five hours, and it then does very little good to administer oxygen; for when the brain has been too long asphyxiated it probably becomes edematous, and degenerative processes set in. It is this condition of post-asphyxial coma, after the primary stage of asphyxia is past and much of the carbon monoxid has come off, that is usually seen in the hospitals. It does no good to transfuse blood from a healthy person into such a patient six or eight hours after the gassing, for by that time his own blood has to a large extent spontaneously thrown off the carbon monoxid and regained oxygen. The continued coma is probably due, not to asphyxia

* From the Laboratory of Applied Physiology, Yale University.
* Report I of the Commission on Resuscitation from Carbon Monoxid Asphyxia. The Commission on Resuscitation from Carbon Monoxid Asphyxia was organized at the request of the American Gas Association, which appropriated a fund to cover the expenses of this and the related investigations to be published in later reports. The commission consists of: Cecil K. Drinker, M.D., Chairman; Walter B. Cannon, M.D.; David L. Edsall, M.D.; Howard W. Haggard, M.D.; Lawrence J. Henderson, M.D.; Yandell Henderson, Ph.D.; Warren K. Lewis, Ph.D.; Francis W. Peabody, M.D.; Royd R. Sayers, M.D., for the U. S. Bureau of Mines, and Charles B. Scott, for the American Gas Association.

1. Haggard, H. W.: Am. J. Physiol. **60**: 244 (April) 1922.
2. Haldane, J. S.: Respiration, Yale University Press, May, 1922.
3. Henderson, Yandell, and Paul, J. W.: U. S. Bureau of Mines Tech. Paper 82, Washington, 1917.

at that time, but to the brain edema and the degenerative processes just referred to.

The point cannot be too strongly emphasized that for treatment to be effective it must be applied at the earliest possible moment after the victim is discovered, and must remove the carbon monoxid from his blood as soon as possible.

3. The third reason why oxygen inhalation is not very effective, even when an efficient inhaler is used, depends on a more fundamental physiologic consideration. It is true that in partial asphyxiations, both as they occur accidentally and as performed experimentally by investigators on themselves, oxygen inhalation effects a considerable alleviation of the headache and other immediate sequelae. It induces also a somewhat, but initially a not very greatly, accelerated elimination of carbon monoxid from the blood. This is essentially the finding of Haldane [2] and his collaborators, in England, of Nicloux [4] in France, and of the authors in experiments on themselves to be here reported.[5]

It is probable, however, that such observations have led to a much too favorable expectation of the benefits of simple oxygen inhalation in persons who have been asphyxiated into coma. In experiments on themselves, investigators have, indeed, induced percentage saturations of the blood with carbon monoxid approximating dangerous concentration. They have not, however, continued the asphyxiation until coma resulted. The ability of their circulation and respiration to effect the subsequent elimination of the asphyxiant unaided has not therefore been greatly depressed; and under such conditions oxygen assists considerably. But when the depression of vitality has gone to the extent that occurs in the victim of an accidental asphyxiation with many hours of coma, oxygen alone is comparatively ineffective. The distinction as regards the rate of elimination of carbon monoxid after brief gassing and after profound asphyxia is much like that occurring in the rate at which patients eliminate ether after short, in contrast to long, anesthesias. With carbon monoxid, as with ether, there is a difference between the extent to which respiration is depressed after slight, in contrast to profound, anesthesia or asphyxia. In both of the latter conditions, respiration is sometimes so feeble that it fails and death occurs even after oxygen inhalation has been applied, for oxygen is not a respiratory stimulant.

The depression of respiration occurring during and after asphyxia, and impelling toward a fatal issue, is probably the resultant of several different, although related, factors and processes: initial overbreathing, disturbance of the alkali and C_H (concentration of hydrogen ions) of the blood, fatigue of the respiratory center, the direct action of oxygen deficiency, and circulatory and edematous conditions. It is not possible—or necessary for the present purpose—to evaluate their relative importance. Probably all play parts in all cases, but of varying relative intensity. The following paragraphs are intended merely to indicate their nature, and to suggest their modes of interaction.

The breathing of a normal man or animal, as is now well known, is largely regulated by the carbonic acid or carbon dioxid produced in the muscles and organs and carried by the blood to the respiratory center in the brain. Carbonic acid is the normal stimulus to this center and thus regulates normal breathing. During asphyxia, however, the oxygen deficiency in the blood exerts an abnormal and excessive action on this center, and induces excessive breathing by which the body's store of carbon dioxid is greatly reduced. In previous work from this laboratory [6] it has been shown that during asphyxia, as the saturation of the blood with carbon monoxid increases, the oxygen deficiency induces a progressively increasing volume of breathing. In a dog in an atmosphere of 0.17 per cent. of carbon monoxid the volume of air breathed per minute was found to increase from the normal expressed as 100, up to 164 per cent. in two hours, and 266 per cent. in three hours. From this high level it decreased progressively in the course of a little more than an hour until death from respiratory failure occurred. In another experiment the increase of pulmonary ventilation was up to 200 in three hours and 350 per cent. in six hours; in another, to 200 per cent. in four hours. During recovery in fresh air, the volume of breathing is often correspondingly depressed. In some cases it is scarcely measurable and only gradually returns. In one case, twenty minutes after removal from the gassing chamber the animal attained a volume of breathing only 66 per cent. of the normal. In another case, respiration was too feeble to move the valves of the mask connected with the measuring apparatus.

This excessively large volume of breathing, maintained sometimes for many hours, predisposes to subsequent subnormal breathing or even to respiratory failure of the apnea vera type. It has also other profound physiologic effects. Thus, in the experiments cited, the carbon dioxid content of the blood, which is now accepted as a measure of the blood alkali in use, fell to 26 per cent. by volume, or 63 per cent. of the initial value; in another experiment the blood alkali was reduced to 76 per cent. of the normal; and in the fatal case mentioned above, it was found shortly before death to be only 37 per cent. of the initial normal value. This condition of extreme acapnia was for a time erroneously regarded as an acidosis, whereas it is rather an alkalosis and involves corresponding disturbances in the equilibrium of the blood and tissues.[7]

Among these disturbances of various equilibriums, one which may perhaps play an important part has to do with the avidity with which hemoglobin retains both carbon monoxid and such oxygen as it still holds, thus further starving the tissues. The work of Bohr,[8] Haldane [2] and Barcroft [9] has shown that variations in the carbon dioxid content of the blood acting through its C_H exert a marked influence on the dissociation of oxygen from hemoglobin. Acapnia and alkalosis induce the condition termed by Barcroft pleionexy, in which the avidity of hemoglobin for oxygen, and according to Haldane for carbon monoxid also, is greatly intensified.

Along with these conditions there is probably also a fatigue of the respiratory center both from the exces-

4. Nicloux, M.: Presse méd. **25**: 153 (March 15) 1917.

5. The authors have been privileged to see also, in manuscript, the results of experiments, closely similar to those here reported, obtained by Dr. R. R. Sayers and Mr. W. P. Yant at the Bureau of Mines Experiment Station, Pittsburgh.

6. Haggard, H. W., and Henderson, Yandell: J. Biol. Chem. **47**: 421 (July) 1921.

7. Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: The Acapnia Theory, Now, J. A. M. A. **77**: 424 (Aug. 6) 1921.

8. Bohr, C., in Nagel's Handbuch der Physiologie des Menschen, Braunschweig **1**: 104, 1909.

9. Barcroft, J.: Respiratory Function of the Blood, Cambridge, 1914.

sive stimulation to which it has been subjected during the period of respiratory excitement and from the anoxemia, the latter acting much like a profound anesthesia. As recent investigations of Haldane [10] have emphasized, "even a slight deficiency in the oxygenization of the arterial blood greatly favors the development of fatigue symptoms in the respiratory center."

In consequence of these, and perhaps of other as yet incompletely analyzed effects, when a victim of profound asphyxia is given an oxygen inhalation he breathes so poorly, draws so little of the oxygen into his lungs, and in consequence displaces so little of the carbon monoxid from his blood that the benefits of the treatment are often for a time scarcely perceptible. Indeed, in experiments carried out for the special purpose of testing this point, some of the animals stopped breathing and died after oxygen inhalation was begun. This occurrence may perhaps be in part a form of the "oxygen apnea" which was first noted by Mosso,[11] and is easily obtained with oxygen after exertion at great altitudes.[12]

After prolonged and profound asphyxia, some accessory factor is needed to stimulate the patient to vigorous breathing so that he may draw the oxygen in and thus wash the carbon monoxid out. The most natural means of obtaining this end is to supply enough carbon dioxid mixed with the oxygen to serve as the immediate stimulus to breathing. Much the same idea has been utilized by the writers to induce vigorous breathing, rapid elimination of ether, and a rapid restoration of consciousness in patients after prolonged anesthesia.[13] The addition of the carbon dioxid to the inhaled air proved highly effective both in stimulating pulmonary ventilation, and in washing out ether from the blood.

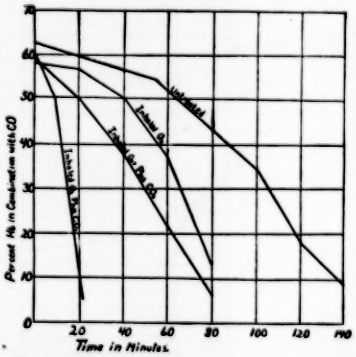


Fig. 1.—Elimination of carbon monoxid from gassed dogs.

EXPERIMENTS ON ANIMALS

Following this line of thought, experiments were performed on dogs, and the results obtained are shown in the four curves of Figure 1. By means of illuminating gas diluted with air, the animals were all asphyxiated to as nearly as possible the same degree, namely, almost to the point of death. Samples of blood were drawn at intervals thereafter and analyzed for carbon monoxid so as to show the rate of elimination. Each curve is the composite of two or more such experiments detailed in the initial publication.[14]

After removal from the gassing chamber, animals of the first group were left to recover spontaneously. As shown in the upper curve, the rate of elimination during the first hour was very slow indeed, depending on the fact that the animals were scarcely breathing.

In a second curve is shown the rate of elimination in animals under oxygen inhalation. The volume of breathing was no greater, indeed, perhaps rather less, than in the previous group, and the rate of elimination was initially only slightly more rapid. With oxygen, as with air, the rate of elimination of carbon monoxid becomes considerable only as the depression of respiration wears off, and efficient pulmonary ventilation returns.

In a third curve is shown the effect of adding a small amount of carbon dioxid to the air which the animals breathed. The breathing was thereby so much increased in volume that a markedly more rapid elimination of carbon monoxid was obtained.

Finally, in the steepest curve is shown the extremely rapid elimination occurring when the animals were made to inhale oxygen containing 10 per cent. of carbon dioxid. Under these conditions, even when the subject was initially so deeply asphyxiated that manual artificial respiration was necessary in order to keep it alive until the oxygen + CO_2 reached the lungs, the respiratory center was within a minute or two stimulated to renewed and increased activity. The breathing returned to normal, and then to nearly or quite the maximum pulmonary ventilation of which the animal was capable. The lungs were thus ventilated with a corresponding volume of oxygen, and under the mass action of this constantly renewed oxygen, an approximately complete elimination of carbon monoxid from the blood was obtained in the course of from twenty to twenty-five minutes. From a state of complete unconsciousness the animals returned to full vital activity, although frequently in a dangerously bad temper.

The only risk which it was found necessary to avoid was an action on the heart due to the use in some of the earlier experiments of excessively high percentages of carbon dioxid; but this risk was obviated by administering a moderate dose of atropin or reducing to some extent the amount of carbon dioxid employed.

EXPERIMENTS ON MEN

In order to determine how far similar results are obtainable on men, the following experiments were performed by the writers on themselves and some of their associates in this investigation. The gassing and treatment were varied from the animal experiments merely by using carbon monoxid prepared from formic acid instead of illuminating gas. Higher concentrations of carbon monoxid were used in these experiments on men than in those on animals, but the periods of exposure were shorter. In the therapeutic inhalation after the gassing, the amount of carbon dioxid

10. Haldane, J. S.: Respiration, p. 8.
11. Mosso, A.: Arch. Ital. Biol. **41**: 138, 1904. Henderson, Yandell: Am. J. Physiol. **28**: 329, 1910.
12. Douglas, C. G.; Haldane, J. S.; Henderson, Yandell, and Schneider, E. C.: Physiological Observations Made on Pike's Peak, Colorado, with Special Reference to Low Barometric Pressures, Phil. Tr. B. **203**: 310, 1913.
13. Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: The Therapeutic Use of Carbon Dioxid After Anesthetia and Operation, J. A. M. A. **74**: 783 (March 20) 1920.
14. Henderson, Yandell, and Haggard, H. W.: J. Pharmacol. & Exper. Therap. **16**: 11 (Aug.) 1920.

added to the oxygen was reduced to 5 per cent., for this amount proved quite adequate to stimulate respiration and is free from the discomfort of higher percentages. Furthermore, observations on men carried out under the direction of Dr. R. R. Sayers at the Bureau of Mines Experiment Station, and mentioned here by his permission, had showed that 10, or even 8, per cent. carbon dioxid is much too high a concentration for the best results on men, involving headache, labored breathing, and other disadvantages. In the following experiments, a mixture of oxygen and 5 per cent. carbon dioxid was therefore used, and no discomfort of this sort was experienced.

The method employed was for the subject to spend from thirty to forty minutes in a gassing chamber of 6 cubic meters capacity, the air of which contained about 0.2 per cent. of carbon monoxid. At the end of this time the blood analyses revealed from 35 to 50 per cent. of saturation. This is enough gas, as previous work here shows, to render an untreated subject severely ill within an hour or two with headache, nausea, vomiting and vertigo. A few hours in such an atmosphere would kill.

Immediately after the subject came out of the gassing chamber, he lay down and the therapeutic inhalation was administered to him for from twenty-five to thirty minutes. Two experiments were done on each of four subjects. With two of these subjects after the first gassing, oxygen and 5 per cent. carbon dioxid were inhaled, while after the second gassing, the next day, an inhalation of oxygen alone was given; on the other two subjects the reverse order was used, without affecting the relative effects of oxygen + CO_2 as compared with oxygen alone. In two of the subjects the rate of elimination with no treatment had been determined in previous work.[15] In a fifth subject only the first experiment, i. e., gassing and treatment with oxygen + CO_2, was performed. In all the experiments, samples of blood were taken and analyzed by the tannic acid method (described below) as follows: (1) before gassing; (2) immediately after gassing; (3) after fifteen minutes' inhalation of oxygen + CO_2 or of oxygen alone; (4) at the end of the inhalation, and (5) half an hour later. The protocols of these experiments follow, together with graphs plotted from the results on two of these subjects.

In these protocols and diagrams it is to be seen that when breathing oxygen the rate of elimination of carbon monoxid is somewhat more rapid than when the subject breathes merely air, but that the elimination is enormously accelerated when the inhalation consists of oxygen + CO_2. In the latter case the breathing is augmented from 300 to 500 per cent., and the removal of carbon monoxid is accelerated proportionally. Thus, a blood concentration of carbon monoxid of from 40 to 50 per cent. saturation, a dangerous amount, was reduced to only 10 or 12 per cent., a quite harmless amount, in half an hour.

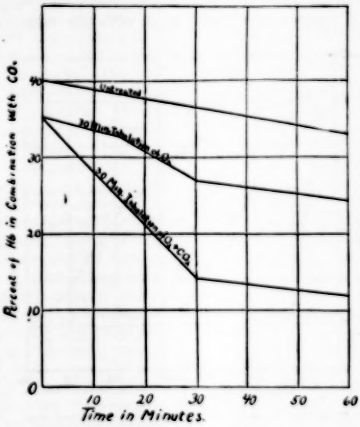


Fig. 2.—Elimination of carbon monoxid in Experiment 1.

PROTOCOLS

EXPERIMENT 1.—Y. H., man, aged 49, weight, 170 pounds (77 kg.):

(*a*) Gassed in 0.2 per cent. carbon monoxid for thirty minutes, standing and moving during the gassing. Then he came out of the chamber, lay down, and inhaled oxygen + CO_2 for twenty-five minutes. The volume of breathing increased from 9 liters in the first minute to 15 liters in the second minute, 20 liters in the third, 30 liters in the fourth, and continued at about this volume through the inhalation. No discomfort was felt during the inhalation, but there was a slight headache afterward; otherwise the subject was well.

(*b*) Same subject, next day, similar experiment; but after gassing, inhaled oxygen alone. The volume of breathing was only 5 liters a minute, i. e., subnormal, during inhalation; respiration was distinctly irregular, almost of the Cheyne-Stokes type. The pulse also for a time was distinctly irregular. During the rest of the day the subject was irritable and tired, but not distinctly unwell.

(*c*) Same subject (two years ago) after similar experiment, but not followed by inhalation of oxygen, was distinctly unwell with throbbing frontal headache for twelve hours.

The rates of elimination of carbon monoxid in these three experiments are shown by the accompanying analyses of the blood for percentage of saturation.

EXPERIMENT 2.—H. W. H., man, aged 30, weight, 200 pounds (91 kg.):

(*a*) Gassed and treated as the subject was in Experiment 1 *a*, and with similar results. The volume of breathing under inhalation of oxygen + CO_2 increased from 9 up to 30 liters or more. He felt no after-effects whatever.

(*b*) Gassed and treated as the subject was in Experiment 1 *b*. Under oxygen alone respiration was at first subnormal, then about normal, 10 liters a minute. Headache developed with increasing intensity all day, with dyspnea on exertion; the subject was rather miserable.

CARBON MONOXID IN BLOOD IN EXPERIMENT 1

Experiment	Before Gassing	After Gassing: 2 Min.	After Gassing: 15 Min.	After Gassing: 30 Min.	After Gassing: 60 Min.	Treatment
	Percentage Saturation of Blood with Carbon Monoxid					
(*a*)	0	35	25	15	12	Inhaled oxygen + CO_2
(*b*)	0	35	32	27	25	Inhaled oxygen alone
(*c*)	0	38	..	..	33	Breathed air

(*c*) After similar but less intense gassing, two years ago, not followed by inhalation of oxygen, this subject developed a frontal headache and malaise lasting all day and followed by insomnia.

EXPERIMENT 3.—S. S., man, aged 28, weight, 130 pounds (59 kg.):

(*a*) Gassed and treated as the subjects were in Experiments 1 *a* and 2 *a*. Under oxygen + CO_2 inhalation, the vol-

15. Henderson, Yandell; Haggard, H. W.; Teague, M. C.; Prince, A. L., and Wunderlich, R. M.: J. Indust. Hyg. **3**:79-92, 137-146, 1921.

ume of breathing increased to 30 liters a minute. He felt no after-effects, remaining entirely normal.

CARBON MONOXID IN BLOOD IN EXPERIMENT 2

Experiment	Percentage Saturation of Blood with Carbon Monoxid: Before Gassing	After Gassing: 2 Min.	15 Min.	30 Min.	60 Min.	Treatment
(a)	0	50	30	15	12	Inhaled oxygen + CO_2
(b)	0	45	42	40	35	Inhaled oxygen alone
(c)	0	34	..	..	29	Breathed air

(*b*) Gassed and treated as the subjects were in Experiments 1 *b* and 2 *b*. The volume of breathing under oxygen inhalation was only a little more than 5 liters a minute. He felt miserable during the remainder of the day.

CARBON MONOXID IN BLOOD IN EXPERIMENT 3

Experiment	Percentage Saturation of Blood with Carbon Monoxid: Before Gassing	After Gassing: 2 Min	15 Min.	30 Min.	60 Min.	Treatment
(a)	0	45	25	15	12	Inhaled oxygen + CO_2
(b)	0	45	40	35	30	Inhaled oxygen alone

EXPERIMENT 4.—M. M. J., woman, aged 30, weight, 160 pounds (73 kg.):

Conditions and results were practically identical with those of Experiments 3 *a* and 3 *b*.

CARBON MONOXID IN BLOOD IN EXPERIMENT 4

Experiment	Percentage Saturation of Blood with Carbon Monoxid: Before Gassing	After Gassing: 2 Min	15 Min.	30 Min.	60 Min.	Treatment
(a)	0	45	25	15	10	Inhaled oxygen + CO_2
(b)	0	40	35	30	28	Inhaled oxygen alone

EXPERIMENT 5.—R. R. S., man:

Gassed and treated as were the previous subjects. Respiration responded less vigorously than is usual in most persons to the stimulation of carbon dioxid in the inhalation. He felt slightly unwell afterward.

CARBON MONOXID IN BLOOD IN EXPERIMENT 5

Percentage Saturation of Blood with Carbon Monoxid: Before Gassing	After Gassing	Under Inhalation: 15 Min.	30 Min.	60 Min.	Treatment
0	35	20	10 (?)	8	Oxygen + CO_2

INVESTIGATION IN NEW YORK CITY

With the foregoing facts as a background, a carefully planned and supervised test of this method of oxygen + CO_2 inhalation for human victims of carbon monoxid asphyxia seemed justifiable.

For some years past, work had been under way in this laboratory on an improved inhaler. During the war one of the authors had developed certain features of such an apparatus for administering oxygen (without carbon dioxid) to soldiers suffering from the irritant war gases. A number of these apparatus had been made and shipped to France, but arrived only as fighting ceased. In the laboratory, meanwhile, a device had been developed for the control and measurement of the flow of gas. Meanwhile also, the sylphon bellows reducing valve, the most perfect device of its kind, had been developed by Mr. W. E. Gibbs for the U. S. Bureau of Mines, and patented by the government for general use. Using these three features, the apparatus shown in Figure 4 was developed under the direction of the writers by the Mine Safety Appliances Company. The writers are indebted to this company for assuming all the risks and expense of development and for freely supplying the six inhalers used in the investigations to be described below.

The apparatus consists of a steel tank or bottle charged to about 120 atmospheres of oxygen and 6 atmospheres of carbon dioxid, that is, 5 per cent. with an allowable variation of ± 0.5 per cent. carbon dioxid. The bottle is connected with the reducing valve, which automatically delivers any quantity of gas that may be drawn at a uniform pressure of about 1.5 pounds per square inch. The gas than passes through the graduated needle valve, which serves both as a control and

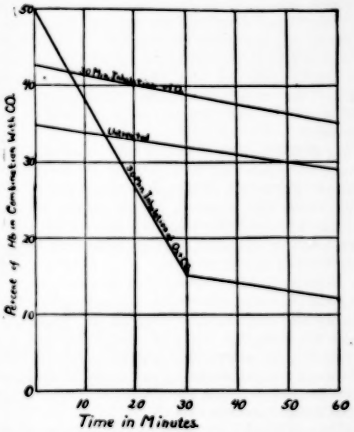


FIG. 3.—Elimination of carbon monoxid in Experiment 2.

as a meter for estimating the volume of breathing, so that the supply to the patient can be adjusted to any volume from 0 up to 30 liters a minute. From this needle valve the gas flows into a bag of rubber and cloth of 4 or 5 liters capacity. Beyond this bag is a pair of disk valves arranged on a T so that the upper one, which has a very light disk, allows the patient to inhale the contents of the bag at the beginning of a respiration, while the lower valve with a heavier disk only opens to admit outside air after the bag has been sucked empty. From the upper disk valve a hose of 0.8 inch bore leads to a snout mask. On the mask is an expiratory valve. This apparatus has been given the name of the H.-H. inhalator.

The following sheet of instructions was put into each of the inhalator boxes:

DIRECTIONS IN BRIEF

I. Open valve at top of tank.
II. Put mask on victim.
III. Turn pointer on dial to 10.
IV. Keep advancing pointer as victim breathes more.
V. Use for from twenty to thirty minutes.

DETAILED DIRECTIONS

1. This apparatus is charged with oxygen and another gas (CO_2) which makes the victim breathe many times the amount he otherwise would. It makes him pump the illuminating gas out of himself.

2. If the victim has stopped breathing before you arrive, apply both manual artificial respiration and the H.-H. inhalator. If anything will start him breathing, this inhalation will.

3. In using the inhalator, open the valve at the top of the black gas bottle. See that the pointer on the nickel plated dial is turned as nearly as possible to O.

4. Put the mask over the victim's face. The lower part goes well below the chin. Press down firmly over the nose. Prevent leaks.

5. When the pointer on the nickel plated dial is at 0 the victim breathes air which he draws in through the inlet valve below the T at the end of the long rubber hose.

6. As soon as the mask is on the victim's face, turn the pointer to 10. This lets gas run from the tank into the rubber bag. The victim breathes this. If he breathes more than runs in, the bag collapses and he draws in additional fresh air through the inlet valve.

7. As the victim's breathing increases, turn the pointer on the dial so as to just keep the bag from collapsing each time he breathes in.

8. If the victim goes well, the breathing will increase to 25 or 30 liters a minute—as shown on the dial—during the first five minutes.

9. Keep the pointer at about 25.

10. Usually twenty minutes of use of the inhalator is all that is necessary, but it may be given in severe cases for forty minutes. More than this merely wastes the oxygen + CO_2.

Among the most serious practical difficulties to be anticipated was that of obtaining a supply of oxygen containing 5 per cent. carbon dioxid. No such gas mixture is at present on the market. This investigation is therefore deeply indebted to the Union Carbide and Carbon Company and the Linde Air Products Company for most generously making and freely supplying all of the oxygen + CO_2 used in these researches.

It was next essential to have a field in which not only a considerable number of asphyxiations were certain to occur in the period of intensive investigation of two months which was planned, but in which there must also exist facilities for reaching the patients at the earliest possible moment, that is, within an hour, or, better, within thirty minutes, after discovery. Previous experience had proved that in most cities even during the winter months when asphyxiations are most frequent, no considerable number of patients are reached soon enough to give the treatment a fair trial. Owing to delays in notification and the lack of the necessary arrangements, gas cases in most cities are not usually reached for from two to three hours or more after discovery.

The city of New York, Borough of Manhattan, however, affords ideal conditions for applying the treatment here under investigation. The Consolidated Gas Company maintains in each of five districts of the city, which owing to the congestion of population are comparatively small in area, an emergency auto truck. Each truck has three crews, each on duty for eight hours.

Furthermore, whenever these trucks are away from their stations, and during the day they are almost continually on the move, they keep constantly in touch by telephone with the central office. Twenty-four hours a day every day in the year, a dispatcher in the office of the gas company is ready at the telephone to receive from the police, from hospitals and from others, calls for the emergency trucks, and the records show that it is only a matter of a few minutes before the nearest truck is at the scene of any gassing accident or similar occurrence. Usually one of these emergency trucks arrives some minutes before the hospital ambulance. The crews of these trucks are trained not only to make repairs to gas leaks, but also to apply artificial respiration both by means of apparatus and by the manual method, an art in which hospital interns and ambulance surgeons should be much more thoroughly trained than at present. The truck crews are intelligent men, interested in their work, and with a large experience in cases of gas asphyxiation. Indeed, it would be difficult to find a more efficient accident service than that which the Consolidated Gas Company maintains for the benefit of the population of New York City. Furthermore, the company placed this organization fully at the service of this investigation. One of the inhalers was carried on each of the five auto trucks, and their crews gave efficient and cordial cooperation.

Through the courtesy of the U. S. Bureau of Mines, which is interested in carbon monoxid asphyxia as a cause of fatalities among miners, one of its medical staff was assigned to assist in the investigation. He lived in a room in the Consolidated Building with special telephone connection and automobile service for all hours of the day and night. One or the other, or both of the writers also spent a considerable amount of time with him each week.

The health department of New York City also furnished invaluable cooperation by which not only the police but every hospital in the city through its ambulance service and in other respects supplied all the facilities asked for. The authorities of Bellevue Hospital and its pathologic department gave particularly valuable assistance.

METHODS OF INVESTIGATION

Even with all this cooperation, the difficulties of the investigation inherent in the conditions under which asphyxiations occur in a great city proved to be very considerable. It is a trying task to wait for days, idle, knowing that a call may come at any minute of the day or night, and then to be called at top speed to one end of the city, only to find that the patient was dead when discovered; to rush back to the other end of the city to find a patient spontaneously recovered, and then to arrive late at a case which would have been ideal, if fully observed. But even in regard to such cases as that last mentioned, much of value was obtained. Each of the rescue crews was instructed to administer the oxygen + CO_2 inhalation as soon as the hospital ambulance arrived and permission was given by the physician. The amount of evidence regarding the effect of the inhalation so obtained from these physicians and the crews was considerable, in addition to that from cases which were directly observed.

Data were obtained regarding a total of eighty cases of asphyxiation; of these, half were under such conditions (usually owing to delay in discovery) that no treatment was given. They afford, however, valuable control observations. A considerable number of persons also were found dead. Of the remainder, some were treated by the methods heretofore in use, and serve as controls on the results obtained with the oxygen + CO_2 inhalation. This inhalation was tried out in twelve severe cases—a number somewhat less than had been hoped for; but in view of the results obtained, they are amply sufficient to justify the investigation and to afford a solid basis for the conclusions to be drawn below.

An elaborate questionnaire was drawn up and mimeographed; and all the information obtainable was inserted in regard to each case. In most cases

the information reduced itself to more or less definite estimations of the following points: (1) previous medical history of the victim; (2) physical characteristics, age, weight, etc.; (3) suicide or accident; (4) size of the room, amount of gas and duration of asphyxia; (5) time elapsed before discovery of victim and application of measures for resuscitation (very important); (6) condition of patient at initiation of measures for resuscitation: respiration, pulse rate and force, and particularly a blood sample for analysis of degree of saturation with carbon monoxid; (7) behavior of patient under treatment; (8) condition, physical and mental, and the blood content of carbon monoxid at the end of the treatment—usually from fifteen to twenty minutes; (9) condition of patient in all respects an hour or two later; (10) next day, and (11) subsequently.

Blood Analysis.—The method for analyzing the blood for carbon monoxid was the so-called tannic acid method, slightly modified from the procedure which Sayers, O'Brien and Yant[16] have been using at the Bureau of Mines Experiment Station. A finger is wrapped with a rubber band, a deep prick is made with a stiletto, and 0.1 c.c. of blood is drawn into a pipet. This blood is immediately delivered into a test tube in 0.4 c.c. dilute ammonia (1 c.c. of strong ammonia in a liter of water). It is essential that the blood and ammonia be immediately mixed so as to lake the sample completely, but the mixture must not be shaken or caused to foam. One and five-tenths cubic centimeters of tannic acid (1 per cent. freshly prepared) is then added and mixed. It takes several hours for the color to develop, or rather for all color not due to carbon monoxid to be converted into the dull brown of the tannated blood proteins. Such samples are read against a scale which must be prepared at practically the same time. For this scale dog's blood is generally used: Five cubic centimeters of the undiluted blood was thoroughly exposed to illuminating gas in a flask by bubbling the gas through the blood until it was completely in foam. One cubic centimeter of this blood was then laked in dilute ammonia. An equal amount of the original blood without carbon monoxid was similarly mixed with ammonia. By taking proportional amounts of these two solutions, mixing them and adding tannic acid solution, a scale was then prepared in a series of test tubes to show 10, 20, 30, 40, 50, 60 and 100 per cent. saturation with carbon monoxid.

The blood from the patient was compared with such a scale the day following. The comparison was always made independently by at least two observers, generally with close agreement in their estimations of the degree of saturation.

It would serve no adequate purpose to report here in detail the forty cases of which we obtained records, but in which no treatment was given. This group includes nearly all those who were dead when found, as well as those so slightly gassed that nothing needed to be done for them. But two or three general statements are in order.

The observations made by the authors during this investigation indicate that a considerable number of the cases of fatal asphyxia recorded as accidental in New York City are really suicides. The published figures[17] for 1920 report 124 suicides by gas out of a total of 360 suicides; they report also 189 accidental fatal gassings out of a total of 2,215 violent deaths, this total including 461 highway fatalities and 367 falls from windows, elevators, etc. In the 313 deaths thus assigned to gas the suicides certainly contributed in reality a much larger proportion, and the accidental gassings were correspondingly fewer than these figures show. The average citizen of New York runs a much greater risk of losing his life in a street accident or by a fall from a window or elevator than from asphyxia; and he may reduce the latter risk practically to zero by the exercise of a little care. In fact, a large proportion of accidental fatalities are due to obviously defective fixtures, chiefly cheap, badly made, old, worn, cracked, loose tubing between the gas jet and stoves or burners of various sorts. This is not a matter over which gas companies can exert any control. The state should regulate the manufacture and sale of the types and qualities of such apparatus, as the medical examiner of New York City, Dr. Charles Norris,[17] has well recommended, and as the gas companies of many cities have also frequently urged.

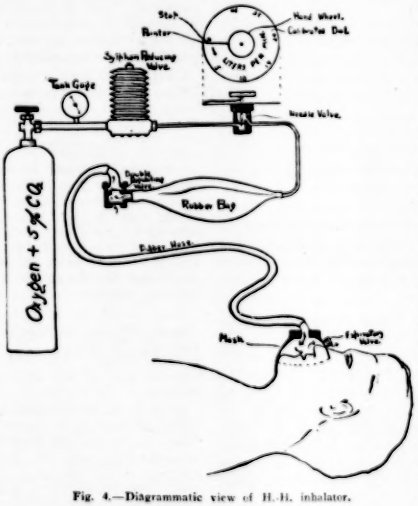


Fig. 4.—Diagrammatic view of H. H. inhalator.

OBSERVATIONS ON CASES OF ILLUMINATING GAS POISONING

The outstanding facts established regarding the cases of illuminating gas poisoning to which the oxygen + CO_2 inhalation was applied may be thus summarized: Not a single case of observable ill effect occurred. Although it did not prove feasible in most cases to administer a preliminary dose of 0.01 grain of atropin, the heart was in no case adversely affected by the concentration of carbon dioxid (5 per cent.) used.

In every case the respiratory response to the inhaled carbon dioxid consisted in a rapid increase in the volume of breathing up to full and deep pulmonary ventilation. Some of the patients were barely breathing and with weak pulse before inhalation was begun. Breathing in some had even to be started by means

16. Sayers, R. R., and Yant, W. P.: Pub. 2356, U. S. Bureau of Mines.

17. Report of Chief Medical Examiner of City of New York, 1918-1921. These statistics are based on the reports of the police, ambulance physicians and others, who are responsible for the misreporting referred to here.

of manual artificial respiration. All, however, in whom there was still life responded effectively, and none failed or sank under the inhalation. Frequently the volume of breathing increased within five minutes to the full 30 liters of oxygen + CO_2, which is the maximum that the inhaler will supply, and beyond which a supplemental volume of atmospheric air is automatically drawn in. In most cases the other vital conditions improved correspondingly.

Most significant was the extremely rapid reduction of carbon monoxid in the blood; the concentration falling from asphyxial amounts to practically negligible percentage saturations (10 or 15) in fifteen or twenty minutes. In several cases the blood was virtually free from carbon monoxid at the end of the inhalation—a result which is distinctly better even than had been attained in the preliminary experiments on men and animals in the laboratory.

As regards the question of artificial respiration, the observations indicate that in patients whose breathing has stopped or is very feeble, the mask of the oxygen + CO_2 inhaler should be held over the face while manual artificial respiration by the prone pressure method is applied. If any procedure can induce the return of spontaneous breathing after asphyxiation by carbon monoxid, this seems most likely to be effective.

In several of the cases of profound asphyxiation, the patients had recovered full consciousness before the end of the thirty or forty minutes of inhalation. Only one patient failed to return to consciousness within an hour or two thereafter. Even more striking is the fact that with this single exception, the patient dying the next day in coma, all of the others made uncomplicated and complete recoveries within a few days.

This is so good a showing that it must be regarded as in part assignable to good luck. There is certainly no reason to expect that every patient asphyxiated for many hours will recover consciousness thereafter merely because all of the carbon monoxid is removed from the blood; the damage to the brain during the asphyxiation may be too profound to allow recovery. But the fact that none of the patients developed pneumonia or any of the common sequelae of asphyxia demonstrates conclusively that the inhalational treatment has no harmful accessory features.

Indeed, as regards the pneumonia which is so common subsequent to gassing, these results suggest that the inhalational treatment may have a distinct prophylactic value; for in one group of forty-three cases (other than those observed in this investigation) in which the victims survived gassing and recovered consciousness without inhalational treatment, the hospital records (Bellevue) show that fourteen (or 33 per cent.) developed a subsequent pneumonia, and ten (or 23 per cent. of the total and 70 per cent. of the pneumonia patients) died. In striking contrast is the fact that not a single patient treated by the inhalational method developed this common postasphyxial pulmonary complication.

The following cases are typical of the reactions observed during the inhalational treatment:

CASE 1.—H. H., a woman, aged 23, weighing 120 pounds (54 kg.) attempted suicide. Gas was escaping from an open jet, and the patient had a short but rather intense asphyxiation, probably less than 2 hours in a fairly high concentration of gas. She had been treated with artificial respiration and an oxygen apparatus for twenty minutes; the blood then contained 45 per cent. carbon monoxid. Oxygen + CO_2 inhalation was given for ten minutes; the blood then contained 20 per cent. carbon monoxid; an hour later, 10 per cent.; four hours later, the blood was virtually free from carbon monoxid. During inhalation, respiration increased from 7 liters to 30 liters; the pulse became strong; the color improved; at the end of the inhalation, the patient was conscious, struggling and very angry at being resuscitated; in the afternoon she had a severe headache. She was sent to a hospital, from which she was discharged next day.

CASE 2.—M. C., a woman, aged 47, weighing 140 pounds (64 kg.), was in coma when first seen at 4:40 p. m. The hose to the gas jet had been disconnected and the gas turned on; the time of exposure was unknown. Respiration was 22, full and deep; pulse, 98, of good volume and regular. No preliminary blood sample was obtained, but from the condition of the patient the degree of saturation of the blood with carbon monoxid may be estimated at about 60 per cent. Oxygen + CO_2 inhalation was given for forty minutes, at the end of which time she was semiconscious, with good pulse, rate 90, respiration 18, regular and fairly deep. At the end of the inhalation the blood showed no perceptible amount of carbon monoxid. The patient was sent to a hospital and made an uneventful recovery.

CASE 3.—M. C. C., a woman, aged 70, weighing 210 pounds (95 kg.), was in a very bad condition when first seen, necessitating manual artificial respiration for a few minutes. A gas jet was partly open, accidentally. The time of exposure was unknown. This was one of the worst cases in the experience of the observers with favorable outcome. The treatment given consisted of atropin sulphate, $\frac{1}{100}$ grain, and oxygen + CO_2 given thirty minutes. No blood sample was obtained initially, but blood saturation was probably well over 60 per cent.; a blood sample taken after the termination of inhalation showed no perceptible carbon monoxid. The patient was taken to a hospital, and three hours later the pulse was strong, 94; respiration regular, 20 a minute. When seen on the second day the patient was normal mentally and in good physical condition; pulse and respiration were regular.

CASE 4.—M. P., a woman, aged about 40, weighing 130 pounds (59 kg.), attempted suicide by means of an open gas jet. Oxygen + CO_2 inhalation was administered for twenty minutes; the ambulance surgeon reported great improvement; it was unnecessary to send the patient to a hospital.

CASE 5.—F. M., a woman, aged 76, had been found in a room with the gas jet turned on. There was a delay of some hours in the call for treatment, so that part of the carbon monoxid had come off; but the patient was still comatose. Oxygen + CO_2 inhalation was administered for twenty minutes. The blood before inhalation showed 30 per cent. saturation with carbon monoxid; after inhalation, 10 per cent.

As an experimental control on these cases it may be mentioned that observations were also obtained on several patients treated with the artificial respiration apparatus heretofore carried by the emergency trucks of the gas company. This apparatus supplies oxygen diluted with air. In one case comparable to the foregoing, the apparatus was applied for forty minutes. An hour later a blood sample showed that the blood was still 35 per cent. saturated with carbon monoxid, and coma continued for twelve hours. Other similar cases were observed. The rate of elimination of carbon monoxid from the blood and of return to consciousness in these cases appeared to be about that which would probably occur if the patients had not been treated at all. Many of the postasphyxial pneumonia cases mentioned above were those that had been treated with artificial respiration apparatus.

SOME PRACTICAL CONSIDERATIONS

In the light of the foregoing observations, three topics present themselves for consideration here,

namely, artificial respiration, the inhalation treatment, and the subsequent treatment in illuminating gas cases.

1. *Artificial Respiration.*[18]—Laboratory experience on asphyxiated animals teaches that the immediate application of the manual method of artificial respiration is nearly always effective in restoring spontaneous breathing. But even slight delay is fatal. The experience of the emergency crews of the Consolidated Gas Company in a very large number of cases tallies exactly with this laboratory finding. Thus it is their practice, when they reach a patient who is not breathing, for one of the men to apply immediate manual artificial respiration, usually by the prone pressure or Schäfer method, while another is preparing the artificial respiration apparatus which they carry. It seems highly probable that more lives are saved by this prompt initial manual treatment than by the apparatus some minutes later. (The general question of the value or lack of value and disadvantages of artificial respiration apparatus will be dealt with in a later report of this commission.)

Among the various methods of manual artificial respiration, the prone pressure method is the most easily applied, affords effective pulmonary ventilation and has no tendency to increase the chance of subsequent pneumonia, and therefore on all of these grounds is best. While one person is applying this treatment, a second may advantageously give the patient an inhalation of oxygen + CO_2. The asphyxial condition is thus counteracted by the oxygen, while the CO_2 stimulates the patient's own respiration to spontaneous effort. The method of administering the prone pressure method of artificial respiration should be that shown in the wall chart published by the U. S. Bureau of Mines.

2. *The Elimination of Carbon Monoxid.*—Once spontaneous breathing has been restored, although the patient may still be deeply comatose, there is no longer need for artificial respiration; it may then be even injurious. This fact might be thought to be obvious were it not so often overlooked in the cases treated with artificial respiration apparatus.

On the whole, the inhalation of oxygen + CO_2, used as described above, has proved a highly efficient method for inducing rapid elimination of carbon monoxid from the blood. The inhaler employed enables the operator to administer a flow of the oxygen + CO_2 mixture exactly adjusted to the demands of the patient's breathing. Thus, these gases may be used most effectively and most economically. The point of economy is important, for an oxygen cylinder of the ordinary portable size when used at the rate of 25 or 30 liters a minute barely holds out for half an hour. It is therefore essential that all of the gas should reach the patient, and that the rate of flow should be accurately adjusted. In the light of the observations here reported, it appears to us unnecessary to prolong the inhalation beyond thirty or forty minutes.

3. *Subsequent Treatment.*—This is a topic on which there is great need for additional knowledge. It appears probable that in untreated cases the continuance of coma for hours after the carbon monoxid content in the blood has been reduced to a comparatively unimportant amount has its basis in a condition of edema of the brain. The thought naturally presents itself, in view of the work of Weed,[19] Cushing[20] and others, that this condition might be overcome by hypertonic salt solution given intravenously or by rectum.

On the other hand, a large proportion of all patients who die a few days subsequently to gassing succumb, not to cerebral injury, but to pneumonia. Measures directed against this risk are more important, that is, they are needed by a larger proportion of patients reaching a hospital, than are measures to counteract the conditions in the brain. Experimental work in these fields is being carried on here with some suggestive results regarding the common pulmonary sequelae; but, owing to the extremely difficult problems involved, no estimate can be formed as to the probable measure of success. Mention should, however, be made here of valuable work demonstrating brain edema after asphyxiation now being carried on by Dr. Stanley Cobb and Dr. H. S. Forbes[21] at the Harvard Medical School.

Until more is definitely known regarding conditions subsequent to gassing, the more completely the medical staff of a hospital leaves a gassed patient alone, and refrains from injections, bleedings, transfusions or other procedures, as yet only vaguely foreshadowed, the greater will be the chance that the patient will not be harmed instead of assisted in recovery. Empiricism seldom helps, and in this field has often killed.

CONCLUSIONS

1. Manual artificial respiration by the prone pressure method should be employed, when respiration has stopped, to start spontaneous breathing. This object may be assisted by administering oxygen + CO_2 simultaneously.

2. Inhalation of oxygen and 5 per cent. carbon dioxid, by causing a very full ventilation of the lungs, rapidly eliminates carbon monoxid from the blood and thus terminates the condition of asphyxia. This treatment is highly effective, inducing rapid and complete recovery, if applied early enough. It requires merely general medical supervision, and may be safely and efficiently carried out by intelligent men of the type composing the emergency crews of a city gas company.

3. Until more definite knowledge has been obtained regarding the conditions in the lungs, brain and elsewhere, subsequent to gassing, and until treatment can be based on such knowledge and has been tested experimentally, it is inadvisable to apply any specific treatment in postasphyxial gassing cases. The evidence here reported indicates that oxygen + CO_2 inhalation and rapid elimination of carbon monoxid greatly decreases the liability to nervous and pulmonary asphyxial sequelae.

NOTE.—It has come to our attention that an attempt has been made to substitute, in place of the special inhaler which we have developed, one of the common artificial respiration devices, namely, the pulmotor. The pulmotor, like all other such devices, is, however, entirely unsuited to this purpose and such use of it can do no good and may even do a patient serious harm. The inhaler which we have used was invented by us for the special and peculiar condition of the oxygen + CO_2 inhalation. No other apparatus now available is capable of functioning as it does, and for the present at least no other should be used on our responsibility.

18. Henderson, Yandell: Science **49**: 431, 1919.

19. Weed, L. H.: Physiol. Rev. **2**: 171, 1922.
20. Cushing, H.: Proc. Soc. Exper. Biol. & Med. **17**: 217, 1920.
21. Cobb, S., and Forbes, H. S.: Personal communication to the authors.

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SATURDAY, SEPTEMBER 30, 1922

THE COUÉ "CURE"

The physician who has learned the phenomena of disease at the bedside, and the structural alterations caused by them in the laboratory, will read with his tongue in his cheek a series of small books which have recently reached this country dealing with M. Emile Coué of Nancy, and his method of "curing" disease. If he reads otherwise, the physician may be compelled to make free use of his handkerchief, for tears of laughter and of pity are bound to flow.

M. Coué, who is not a physician, but, so far as we are informed, a former apothecary, has in later years devoted himself to hypnotism and suggestion. For the last ten years, as our Paris correspondent has said in several letters, Coué has been publishing his "discovery" and preaching his doctrine in his native land, and during the past winter in England, where he had much notoriety. He calls his little book, a pamphlet of less than a hundred small pages, "Self Mastery by Conscious Autosuggestion." According to him, autosuggestion is, like sin, an original endowment. We possess it at birth, and in it resides a marvelous and incalculable power. If we know how to practice it consciously, it is possible to avoid provoking in others bad autosuggestions; to provoke good ones instead, thus bringing physical health to the sick and moral health to the neurotic and erring, and to guide into the right path those whose tendency is to take the wrong one.

He and his admirers and protagonists have published testimonials of cures of organic heart disease, tuberculosis, asthma, prolapse of the uterus, Pott's disease, frontal sinus disease that resisted eleven operations, paralysis of various members, club foot, bunions, varicose ulcer, and virtually all the ills to which the flesh is erroneously alleged to be heir, but which it unfortunately and frequently displays. He does it in a very simple way; that is, he doesn't do it at all: the patient does it. The patient tranquilizes himself, makes his mind as nearly blank as possible, and says articulately, preferably in a semidetached and dreamy sort of way, "Every day in *every* way I grow better and better." The second "every" must be emphasized, and that the verbigerating articulator does not get mixed in "his love," he is recommended to make use of an improvised rosary, that is, a string with twenty knots tied in it, and in this he must "autosuggest" every morning before rising, and every night on getting into bed. If the poor devil has a transverse myelitis, a septic endocarditis, or a carcinoma ventriculi and cannot rise, or if he should be unable to get back into bed, there can be no harm in lying to himself the moment he hears the sparrows chirping in the morning, and when the night nurse comes on duty. Nor can there be any objection, as a pious follower of M. Coué, the vice provost of Eton College, has recently written, to adding to the childish phrase the childlike words, "Thank God." But M. Coué has not subscribed to this, and up to the present writing it is wholly unorthodox. He is very insistent that there is no supernatural element in the cure. The imagination does it all. He is at great pains to impress patients that he does not cure them, nor does he, like his immortal fellow countryman Ambroise Paré, who said "I dress your wounds but God cures them," invoke or admit Divine intervention.

When M. Coué functions personally in the cure, the program is somewhat more elaborate. He tells his patients, in groups, that their organs are functioning properly, that the heart beats in a normal way, that the lungs, stomach, intestines, liver, bile duct, kidneys and bladder are doing their duty, that they will sleep soundly, that their dreams will be pleasant, that troubles and worries will melt away, that they will awake to sing, not sigh, that there will be no more fears, no more thoughts of unkindness, and that shyness and self-consciousness will vanish. Above all, he assures them that their bowels will move regularly and copiously. The vice provost of Eton relates that at one of the séances "hardly had M. Coué finished speaking of the certain cure of constipation when the sufferer he had been addressing hurried from the room, announcing with mingled surprise and triumph that the event was going to justify the prediction." The vice provost of Eton naively adds that these things are said more easily in French than in English, and that there was only a little ripple of sympathetic laughter, while M. Coué smiled at the startlingly sudden fulfilment of his promise. He might legitimately, however, have been very stern and said: "Oh, ye of little faith," etc.

For M. Coué, the unconscious self is the grand director of all our functions, and when the grand director nods, our functions go wrong. The will is its sinister motivator. The imagination turns the face of the unconscious self toward the East. Hence, train the imagination; never seek to reeducate the will. "If you can persuade yourself that you can do a certain thing, provided it is possible, you will do it however difficult it may be." Sink a 20 foot putt, for instance, every time the match depends upon it.

These are M. Coué's laws: When the will and the imagination are antagonistic, the imagination always

wins. In the conflict between the will and the imagination, the force of the imagination is in direct ratio to the square of the will. When the will and the imagination are in agreement, one is multiplied by the other. The imagination can be directed.

M. Coué says that, such being facts, it would seem that nobody should be ill. One doesn't see why he should not be ill if he encounters pathogenic organisms under conditions favorable to their propagation, or if he habitually breaks the rules of hygiene, or if his ancestors have been niggardly or sinister in giving him a good and resistant constitution. "Every illness, whatever it may be, can yield to autosuggestion." Despite such assurance, the prudent physician will go on feeding arsenic and mercury to the pale spirochete and its depredations, quinin to the ubiquitous plasmodium, and antitoxins to the terrifying bacillus of Loeffler.

Meanwhile, purveyors of cloudy stuff, like M. Coué, cure many persons who are ill or who comport themselves as if they were ill, and for this we are, and shall continue to be, grateful. But to accept any of his "laws" as established, or as consistent with the established principles of psychology, is quite impossible; such acceptance would conflict with common sense and with the facts of pathology, which are as firmly established as facts can be.

THE POTENTIAL REACTIONS OF FOODS

The impression that foods which have an unmistakable acidity behave as real acids in the organism is still widespread among the laity, and also finds occasional expression on the part of physicians. Modern biochemical investigation has clearly demonstrated, however, that the natural reaction of a food material is no criterion of the part it may play as acid or base in the metabolism. The processes by which energy is liberated are essentially oxidative in character. The ingesta are normally subjected to oxidation in the body, so far as they can be transformed in this way. Consequently, it may readily happen that a food which is acid in reaction may, from the standpoint of metabolism, be potentially basic. The potential reaction depends on the nature of the residual inorganic components when the product is oxidized. The proteins, with their content of sulphur and sometimes phosphorus, yield sulphuric and phosphoric acids, respectively, in this way; they are acid-yielding foodstuffs. Animal products, as a rule, tend to yield an excess of acid radicals; but many acid fruits and vegetables which owe their characteristic reaction to the presence of organic acids and their salts yield an excess of base in the body. The organic complexes are burned up in the metabolism, leaving carbonates which are potentially basic. The rule is not a universal one; for there are organic acids, as benzoic and tartaric acids, present in natural foods, which escape oxidation for the most part. These function, therefore, like real acids, whereas other members of the organic series, such as citric and malic acids, likewise present in edible products, are better destroyed in the body so that their identity as acids is entirely lost.

The practical application of these chemical features of metabolism was clearly indicated by Blatherwick [1] in actual feeding trials on man. These showed that foods which have a preponderance of base-forming elements lead to the formation of a urine which is less acid, as regards both hydrogen-ion concentration and titration acidity, and which has an increased capacity for dissolving uric acid, while the ammonia content of the urine is diminished and the carbon dioxid tension of the alveolar air, indicative of reserve alkalinity, is increased. Conversely, foods with a predominance of acid-forming elements increase the urinary acidity and urinary ammonia, decrease the uric acid solvent power, and show, through lowered carbon dioxid tension of the alveolar air, a tendency toward depletion of the reserve alkalinity of the blood. Some writers have gone so far as to suggest that the benefits to health ascribed to the free use of milk, vegetables and fruits in the diet may be attributable in part to the fact that these foods yield alkaline residues when oxidized in the body.

The large capacity of the organism to oxidize the organic acids of fruits in the body so that the net result is a gain of base is well shown by recent experiments of Blatherwick and Long.[2] The subjects drank on one occasion 2,400 c.c. of orange juice, or the equivalent of about twenty-four large oranges, containing approximately 48 gm. of citric acid. This always resulted in the production of alkaline urines, an increased organic acid excretion, and a decreased ammonia content of the urines. It was impossible to overreach the organism's ability to oxidize the contained citric acid. One may therefore feel secure, as the California investigators remind us, in eating unlimited amounts of oranges without fear of acidotic effects.

How unwarranted it may be to dogmatize about the behavior of foods containing organic acids, even when the latter are of a sort known to be burned readily in the organism, is shown by further experiments of Blatherwick and Long with sour milks. The drinking of large amounts of lactic acid milks caused the formation of strongly acid urine, although the lactic acid appeared to have been completely oxidized or retained, as there was no change in the organic acid excretion. The increased acidity was shown to be due to the excretion of increased amounts of acid phosphate, as indicated by simultaneous increases in titratable acidity and in phosphorus. This is a somewhat unexpected out-

1. Blatherwick, N. R.: The Specific Rôle of Foods in Relation to the Composition of the Urine, Arch. Int. Med. **14**: 409 (Sept.) 1914.
2. Blatherwick, N. R., and Long, M. Louisa: Studies of Urinary Acidity, I. Some Effects of Drinking Large Amounts of Orange Juice and Sour Milk, J. Biol. Chem. **53**: 103 (July) 1922.

come when one recalls that fresh milk should theoretically yield an almost neutral urine. Apparently the entrance of lactic acid into the blood stream by absorption from sour milk evokes a compensatory elimination of acid phosphate by the kidney. The increased acidity of the urines resulting from the eating of fruits containing benzoic acid, and the strongly acid urines of diabetic patients may perhaps be produced in a somewhat analogous manner, as Blatherwick and Long suggest. In view of the extensive use of sour milks of various types at the present time—in many instances for admittedly therapeutic purposes—their unexpected behavior in promoting urinary excretion of acid is worthy of more than passing notice.

THE PROPORTION OF CARBOHYDRATE IN THE MODERN DIET

This time it is the carbohydrates in the diet which come in for a respectable restriction. The advocates of "low protein" have been much in the limelight in recent years in nutrition controversies. "High fat" has never been a popular dietetic slogan; in fact, since the beginning of the World War it has sometimes been difficult to realize even the possibilities of a little fat in the ration, owing to the comparative scarcity and high cost of this foodstuff. Thus, carbohydrates have remained to fill our energy needs most suitably. No other foodstuff is so economically secured. Ten cents will purchase 3,000 food-fuel units in the form of sugar, and more than 1,000 calories of the carbohydrate-rich bread. No other foodstuffs can compete with these bargains in food values. Yet Holt and Fales [1] now tell us that the economic advantage of carbohydrate foods over fats and proteins has brought about a tendency to allow carbohydrate to form an excessive proportion of the modern diet.

In a statistical dietary study of more than 100 healthy children from 1 to 18 years of age, Holt and Fales found the carbohydrate intake to average 10 gm. per kilogram of body weight. Of this, 51 per cent. was sugar, including lactose, saccharose and fructose, and 49 per cent. was starch. What are the objections to the larger intake of a food physiologically and commercially so economical? The crux of the argument is that if the proper caloric intake is maintained, a very high proportion of carbohydrate necessitates a low proportion of either fat or protein. Hence, there is a possible danger of reducing the amount of fat or protein below that which is necessary for normal nutrition. When a diet high in carbohydrate and low in fat and protein is taken, there may result an excessive retention of water in the tissues of the body. High carbohydrate feeding, we are further told, leads also to an excessive deposition of fat in the body.

The New York pediatricians are doubtless on safe ground when they contend that definite digestive disturbances, chiefly intestinal, may be produced when the carbohydrate in the diet is excessive. There may result increased fermentation with loose acid stools, or constipation with flatulence and abdominal distention. When long continued, these disturbances are very difficult to control. It seems somewhat unwarranted, however, to correlate the high proportion of carbohydrate in the modern diet with the prevalence of dental caries. The causation of tooth decay is far from settled, despite the galaxy of hypotheses to account for it.

What, then, shall be a tolerable apportionment of carbohydrate furnished to the adolescent child? The total calories needed at any age can now be computed with a reasonable degree of accuracy. Holt and Fales determine the amount of carbohydrate needed by subtracting from the total caloric need the calories supplied by the needed amounts of fat and protein. On this basis there should be allowed for the healthy child of average activity about 12 gm. of carbohydrate per kilogram at 1 year, decreasing to between 9 and 10 gm., or about 1 per cent. of the body weight, at 6 years, and maintaining this value throughout the remainder of the growth period. If the total caloric need is raised above the average by increased muscular activity, they add, carbohydrate may be used to provide the entire amount of extra energy, since an increase in muscular activity does not increase the needs in protein or fat above the normal.

1. Holt, L. E., and Fales, Helen L.: The Food Requirements of Children, Am. J. Dis. Child. **24**: 44 (July) 1922.

Current Comment

PARATHYROID TETANY AND CONVULSIVE CONDITIONS

If parathyroid tetany is an intoxication caused by poisons that are water soluble and excreted by the kidneys, it might be prevented or controlled by maintaining a vigorous diuresis with intravenous injections of isotonic salt solutions. On this hypothesis, Luckhardt and Rosenbloom [1] injected ordinary Ringer's solution intravenously into parathyroidectomized dogs. The animals received from 33 to 50 c.c. per kilogram of body weight at each injection, and were injected two or three times daily. They were fed a mixed diet consisting chiefly of meat. Under this treatment, the dogs remained alive indefinitely. After about forty days, further injections were unnecessary, and the animals remained in good health on a normal diet. However, if large quantities of meat were fed or if the dogs became constipated, symptoms of tetany reappeared. In some animals, symptoms of marked parathyroid tetany could be induced at will simply by stopping the injections and feeding the animals meat. In one animal the severest tetany was induced on the one hundred and twenty-first day by feeding meat mixed

1. Luckhardt, A. B., and Rosenbloom, P. J.: The Prevention and Control of Parathyroid Tetany, Proc. Soc. Exper. Biol. & Med. **19**: 129, 1921; The Control and Cure of Parathyroid Tetany in Normal and Pregnant Animals, Science **56**: 48 (July 14) 1922. Luckhardt, A. B., and Blumenstock, J.: The Recurrence of Acute Parathyroid Tetany in Completely Parathyroidectomized Animals During the Oestrus Cycle, Science **56**: 258 (Sept. 1) 1922.

with barium sulphate as a constipating agent. Pregnant animals were kept alive, under such conditions, with much more difficulty than normal nonpregnant animals. One such dog went into labor on the day of the parathyroidectomy, and although her attacks of tetany were unusually severe, she was kept alive by injections of Ringer's solution, and cared for four of her puppies until they were weaned. This animal at the time of reporting (eighty-seven days after operation) was alive and in excellent physical condition. Another interesting occurrence was noted in two parathyroidectomized dogs which had been cured, or at least had reached the stage at which further injections were unnecessary, as long as they ate normally and were kept from becoming constipated. When these dogs went into "heat," symptoms of severe tetany reappeared. Enemas and the intravenous injection of Ringer's solution during the estrual period controlled the symptoms. These experiments on dogs seem to indicate that the cause of the tetany was an exogenous poison or poisons derived chiefly from the food proteins. An explanation is difficult for the recurrence of severe attacks of tetany during the estrual period, months after the animals were entirely free from symptoms. However, the method of control and prevention of the attacks was identical in the two instances, and it was simple as well as efficient. Certainly the results conclusively prove that the parathyroid glands are not essential for life, as has been generally supposed, and, as indicated by the authors, they seem to offer important considerations for our study and therapy of convulsive conditions.

"PROPRIETARY MEDICINES AND THE DOCTOR"—AND BOTTLE MAKER

The physicians of the country have been flooded during the past few weeks with a leaflet reprint sent out by a trade publication, *The Glass Container* of New York City, but mailed from Chicago, where are located headquarters of the "patent medicine" organization. The title of the leaflet is "Proprietary Medicines and the Doctor," and it is supposed to give "Vital Reasons Why the Medical Profession and the Medicine Man Should Pool Their Ideals and Work Together to Benefit Humanity." The author of the leaflet, which is a reprint from *The Glass Container* for May, 1922, is Irwin G. Jennings. The reprint is prefaced with a biographical sketch of "Judge Jennings," a lawyer who it is claimed holds an "A. M." from Marietta College and "Ph.D." from Columbia University. The sketch fails to mention that Mr. Jennings is business manager of the "Glass Container Association" which, of course, is essentially interested in the development and extension of the glass bottle business; nor is it mentioned that Mr. Jennings is the editor of the official organ of this association, *The Glass Container*, in which the article originally appeared. The thesis that Mr. Jennings develops in his paper is briefly this: (1) "The bread and butter and economical success" of physicians "depends on establishing and maintaining a conviction in the minds of the American public that there are curative properties in properly selected drugs"; (2) the "patent medicine" interests "*unassailed*, can easily keep the American public sold to the curative properties of drugs"; *ergo*, (3) the physician, as a business proposition, should not assail the "patent medicine" maker! The work is rather crude; in fact its very crudity makes one wonder how a Ph.D. (Columbia) could imagine that he could get away with it. In the development of his thesis Mr. Jennings runs in the usual stock arguments of the "patent medicine" people in favor of their business, arguments that are as feeble as they are fallacious. It is not necessary to refute or even to discuss this phase of his paper. We imagine Mr. Jennings is in no way to blame; he probably accepted the data furnished him by the nostrum people. That the business manager of the Glass Container Association and the editor of its official journal should favor the "patent medicine" business is understandable and natural. Nostrum makers are, doubtless, his best customers. As the shoemaker says, "There's nothing like leather." The astounding feature of the whole thing is that a man of intelligence should, in 1922, attempt to convince physicians that the only therapy of modern medicine is drug therapy. In his effort to do this, Mr. Jennings has undertaken a large and hopeless job.

INTRODUCING A NEW DRUG

To what extent are the claims for the virtues of a new drug tinctured by commercial considerations? Even though put out as the result of investigations carried out by the scientific staff of a firm of standing, the question arises: To what extent is the scientific staff of a commercial concern influenced by the commercial atmosphere of competition and dividends in which they do their work? And even when a drug is the result of studies carried out by investigators who have no commercial connections there is the thought: To what degree has the investigator's enthusiasm tinctured his judgment? An increasing number of physicians adopt the plan of giving no consideration to new drugs until these have received the stamp of approval from the Council on Pharmacy and Chemistry and are listed among New and Nonofficial Remedies. While, as the Council cautions, acceptance of a drug for New and Nonofficial Remedies is not proof that the worth of the drug has been definitely determined, the recognition does mean that it is of definite composition and that there is sufficient evidence of its therapeutic worth to warrant its trial by physicians. What seems to be an almost ideal method of introducing a new drug has been followed in the case of "flumerin," the name given to the disodium salt of hydroxy-mercuri-fluorescein. At the 1922 session of the American Medical Association, a paper[1] on flumerin was presented to the Section on Dermatology by White, Hill, Moore and Young of Johns Hopkins. The chemical identity of the new mercurial was defined in this paper; animal experiments were reported which demonstrated its efficiency in experimental syphilis, as were also clinical trials which had been made after the animal experiments had warranted such trials. The clinical work gives promise that the

1. White, E. C.; Hill, J. H.; Moore, J. E., and Young, H. H.: Flumerin—A New Mercurial for the Intravenous Treatment of Syphilis: First Report of Chemical, Animal and Clinical Experiments and Results, J. A. M. A. **79**:877 (Sept. 9) 1922.

new mercury salt may prove of considerable value. The investigators announce, however, that flumerin is not to be made available commercially unless independent clinical study confirms their findings. In order that syphilologists may feel warranted in including flumerin in their studies, Dr. White and his collaborators requested the Council on Pharmacy and Chemistry to examine the evidence for the preparation. The Council has published a preliminary report[2] announcing that while the drug is in the experimental stage, and although the evidence to prove that it is a worth-while addition to the long list of mercury salts used in the treatment of syphilis is still incomplete, the product is suitable for clinical trial in selected cases. Should this product become an addition to our materia medica, it will be as the result of the orderly procedure: (1) demonstration of its chemical identity and uniformity; (2) animal experiments giving promise of therapeutic value; (3) clinical trials under the auspices of the discoverers, and (4), confirmation of its therapeutic worth by independent clinical investigations.

VICTORY FOR FOREIGN DRUGS

In the haste of last hour legislation, and particularly through the compromise on drugs and dyes made by the congressional conferees on the tariff bill, American organic chemical industry is faced with a discouraging situation. The earnest work of the last six years to make the United States self-sufficient in the matter of synthetic drugs and necessarily the interdependent dyes, the concomitant enthusiasm for the chemical profession stimulated in our universities, and a large amount of capital invested in plants, are about to be sacrificed. The prewar condition of foreign domination of our materia medica is imminent, a period when it seemed that any product which could not be used as a dye was quickly added to the increasing list of synthetic drugs. Thanks to American control, physicians no longer are being flooded with advertisements of new unessential synthetics, while the really valuable drugs are being made in this country in adequate quantities; the drugs are pure and the prices are fair. Under the legislation just passed, the drugs and dyes derived directly from coal tar received some protection—though inadequate—based on *American valuation*. On the other hand, the synthetic chemicals of non-coal tar genesis (about 30 per cent. of all organic chemicals), including many valuable drugs, received no practical protection; they may be imported on a 25 per cent. duty based on *foreign valuation*. Furthermore, it is stated that large stocks of dyes and medicinals taken in lieu of reparations, costing relatively little, are held in England, France, Belgium and Italy. Yet these countries are protecting their own industries by embargo or measures similar to the recently terminated license import system of this country. It is asserted that this enormous surplus material will be shipped immediately to the American market. Development of the next few weeks will be watched with anxiety by those interested in organic chemistry in the United States; and if the predicted dumping of these products from Europe on the American market actually does occur, a renewed effort should be made at the December session of Congress to protect the basic key industry so necessary for the conservation of health as well as national security.

2. Flumerin: Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. **79**: 897 (Sept. 9) 1922.

THE COW—MAN'S BEST FRIEND

This note is written to sing the praises of a new use for the genus *Bos*, the producer of milk, most noble of fluids; the yielder of beef, most important of meats; the source of leather; whose ultimate destination is glue and gelatin. Consider, too, the bovine genus as a contributor of vaccine, as a donor of endocrine products, as a component of fertilizers. Now Major W. S. Patton, in the *Indian Journal of Medical Research*, announces[1] the "value of a tame cow for collecting the blood-sucking *Diptera* of a locality." The technic is simple. A tame white cow is taken near water in thick brushwood at dusk. The cow stands. The blood suckers collect. At the psychologic moment they are brushed into a net, evidently to the intense enjoyment of the cow—for she does not stir during the procedure, and is soon ready for a new venture. In comparison with this maneuver, the Trojan horse of Ulysses was child's play in strategy. Henceforth no parasitologic investigator's equipment will be complete without a tame white cow.

1. Patton, W. S.: Note on the Value of a Tame Cow for Collecting the Blood-Sucking Diptera of a Locality, Indian J. M. Res. **10**: 65 (July) 1922.

THE APOTHEOSIS OF SALACIOUSNESS

What thinks the rational man—particularly the rational physician—of the noisome scandal now being aired in South Bend, Indiana? What of the remarkable revelations of human abasement reported in certain of our enterprising (?) newspapers as the testimony in the case? What of the editorial responsibility of these newspapers? What of their estimate of "what the public wants?" And if the public is really interested in this and similar salaciousness—which is doubtful—are the editors rendering the public a service in satisfying such craving? What a pitiful spectacle the whole mess is!

> In Köln, a town of monks and bones
> And pavement fanged with murderous stones,
> And rags, and hags, and hideous wenches,
> I counted two and seventy stenches,
> All well defined, and several stinks!
> —Coleridge.

ALCOHOL PRESCRIPTION REGULATIONS

On another page of this issue is published a recent Treasury Decision covering the prescribing and medication of alcoholic liquors. Physicians who possess permits to prescribe alcoholics, or who are at all interested, should carefully read these new regulations of the Prohibition Commissioner. This continuous modification of requirements shows how unsatisfactory conditions are and how difficult it is to provide regulations that will actually regulate. It seems questionable whether the new regulations are not a backward rather than a forward step, in some particulars at least!

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Malta Fever Appears in State.—Dr. Gleason C. Lake of the U. S. Army Medical Corps arrived recently in Phoenix to conduct a campaign against the Malta fever epidemic, which has appeared during the last three weeks in the Salt River Valley. With the outbreak of the epidemic, the state superintendent of health wired the federal authorities for an experienced officer to assist in handling the situation, and Dr. Lake was given the commission. The appearance of Malta fever in Arizona is regarded as curious. Fifteen cases appeared in a short time, with one fatality. Acting on the theory that milch goats act as carriers of the germ, a herd of 500 goats from which Phoenix obtains its supply has been placed under quarantine, and the sale of goat's milk stopped by the city authorities.

ARKANSAS

Health Instruction for Teachers.—A movement to instruct the rural teachers of the state in the work of the state health department, in order that they may, in turn, aid the children in keeping health rules, has resulted this year in the incorporation of health studies in the program of county teachers' institutes in Arkansas.

CALIFORNIA

Vote Aid to World War Veterans.—At the second annual meeting of the State Conference of Hospitals of California, resolutions endorsing the plan of the League for the Conservation of Public Health for better aid to disabled veterans of the World War, for more efficient handling of hospital promotion and organization and for active opposition to the so-called antivivisection, chiropractic and osteopathic board measures, were adopted. A resolution was passed praising Col. Simon J. Murphy for his donation and equipment of the Murphy Memorial Hospital for Whittier.

Personal.—Dr. Edwin William Schultz, who has been a student in pathology at the Mayo Foundation, Rochester, Minn., has returned to San Francisco to resume his duties as associate professor of bacteriology and experimental pathology at Stanford University.——Dr. William B. Palamountain, Oakland, lost the first finger of his left hand at the first joint recently in working with the engine on his car.——Dr. Northrop has been appointed assistant physician to San Quentin state prison to succeed Dr. Chester A. DeLancey, who resigned recently to go into private practice at San Anselmo.——Dr. William Day Moore has resigned as health officer of San Pedro in order to give his entire time to his private practice.

Bill to Create Chiropractic Board.—A mass meeting of all chiropractors in northern California was held in San Jose, Aug. 6, 1922, for the purpose of outlining the wind-up of the chiropractors' campaign for the enactment of a bill creating a state chiropractic examining board. Claiming that there was no representation of their profession on the state medical board, they disputed the qualification of the board to regulate their profession, and stated that such regulation amounted to virtual oppression of the profession. A total of 365 chiropractors have been arrested by the medical board in its "regulation" of chiropractic in the past two years, according to a recent announcement from the chiropractic committee. It is claimed by the chiropractors that the proposed bill will remove the alleged oppression of the medical board and create a self-sustaining board, appointed by the governor, composed of chiropractic authorities only, to regulate and license the chiropractic profession.

COLORADO

Personal.—Dr. William C. Finnoff, Denver, has gone to Vienna, Austria, for graduate study.——Dr. William B. Lutes, Merino, who spent two weeks recently in a Denver hospital, with an infection of the hand, is now able to return to his practice.——Dr. Grant S. Peck, Denver, returned recently from Vienna, Austria.

Nutrition Institute for Children.—The Colorado Tuberculosis Association has secured the services of Dr. William R. P. Emerson, Boston, for a two weeks' institute on the nutritional problems of children. The institute will be held in Denver, October 18-November 1. The course is not limited to residents of Colorado, but is available to students from neighboring states. The tuition fee for this course will be $25.

DELAWARE

Delaware State Medical Society.—The annual meeting of the association will be held in Dover, October 10, under the presidency of Dr. John W. James, Dover.

DISTRICT OF COLUMBIA

School of Public Health for Negroes.—With the opening of the fall term of Howard University, Washington, a school of public health and hygiene will be opened for the training of colored men and women in the field. A school of social service and a school of physical education, both leading to collegiate degrees, will be within the scope of the public health school, it is reported.

School of Neurology and Psychiatry.—A school for graduate teaching of diseases of the nervous system was organized in Washington recently under the name of the Post-Graduate School of Neurology and Psychiatry of the District of Columbia. The school will be formally opened in October. Dr. William A. White, superintendent of St. Elizabeth's Hospital, is president of the institution; Dr. Tom A. Williams, vice president; Dr. D. Percy Hickling, dean of the faculty, and Dr. Daniel D. V. Stuart, Jr., secretary-treasurer. Two courses of six weeks each, elementary and advanced, will be offered, together with an elective course in special subjects.

HAWAII

Medical Meeting.—The annual meeting of the Medical Society of Hawaii will be held in Honolulu, November 19-20. Dr. Grover A. Batten of Honolulu will preside.

ILLINOIS

New Hospital Addition Completed.—The new 100 bed addition to the West Suburban Hospital, Oak Park, will be ready for occupancy in October, it was recently announced by Superintendent Hockaday. This will bring the capacity of the institution to 250 beds.

Special Tax for Tuberculous Patients.—The Springfield Tuberculosis Association recently went on record as endorsing the proposition of levying a special tax for the purpose of caring for persons in Sangamon County suffering from tuberculosis. The proposition will be submitted to the voters in November and provides for care of the tuberculous under the Glackin law of 1917.

Personal. — Dr. Duncan F. Stewart, Galva, has been appointed coroner of Henry County, to succeed Dr. Axel F. Benson, who resigned recently, and will reside at Austin. ——Dr. Cecil M. Jack, Decatur, has been elected president of the Macon County Tuberculosis Association. —— Dr. William E. Rice, Tuscola, who has been making a study of tuberculosis and its treatment at a special summer school in Colorado, has returned to Tuscola.

State Board of Registration and Education.—The new director of the board, A. M. Shelton, who succeeded W. H. H. Miller, has asked the resignation of members of fourteen boards under the jurisdiction of the department, which has headquarters at Springfield. About seventy-five resignations are in the hands of the new director, and in each case, he states, courteous letters have accompanied the requested resignations. It is expected that a number of the old members will be reappointed.

Physicians Lose Right to Prescribe Whisky.—It is reported that 1,500 physicians in Illinois will lose their right to prescribe whisky as they will not receive prescription books at the quarterly issuance. Approximately this number of permits have been revoked for various reasons. It is asserted that about 7,000 physicians in Illinois have permits to prescribe spirits, but that the prohibition office will make further cuts and that several hundred more may be eliminated if physicians do not show greater care in the use of their books.

Chicago

Higher Medical Standard.—At the quarterly meeting of the Illinois State Medical Society, proposals that higher medical standards be adopted for medical practice in Illinois to meet the requirements for licenses in all states were discussed.

Child Health Welfare in Chicago.—With the death rate of babies in Chicago a little more than 11 per cent., the deaths among the babies who have received the care of the Infant Welfare Society has been reduced to less than one fifth of 1 per cent.—an almost irreducible minimum, according to a report issued by the society. The society handled 5,456 cases during the month of July.

Heat Ordinance to Be Enforced.—The city health commissioner announced, September 17, that the new minimum heating ordinance will be rigidly enforced beginning, October 1. This ordinance provides for the maintenance of a minimum temperature in apartments of 60 degrees at 6:30 a. m., 65 at 7:30, and 68 by 8:30, which is to be maintained throughout the day until 10:30 p. m.

INDIANA

Farewell Banquet to Dr. Hurty.—Officials of the state board of health gave a banquet in honor of Dr. John N. Hurty, September 22, at the Hotel Lincoln, Indianapolis. Dr. Hurty has resigned as secretary of the state board of health, following twenty-six years of service.

IOWA

Iowa Wins Health Crusade.—The silver loving cup, the gift of an anonymous New Yorker who calls himself "the friend of the children," has again been awarded to the state of Iowa. This cup is awarded yearly to the state whose schools have the highest percentage of total population successfully completing the Modern Health Crusade. The National Tuberculosis Association stated that the Iowa schools had won five out of eleven first prize banners and sixty-eight out of 182 second prize pennants.

Health in Tourists' Camps.—A new department has been created by the state board of health to look after tourist parks and see that they comply with certain conditions in regard to sewage disposal, water supply, shelter houses and caretakers. Every camp in the state will come under the supervision of this department and inspectors will be sent out to investigate conditions and make a report. If the camps do not meet the requirements or if the authorities are not given assurance that they will be made to comply with all the regulations, the park will not be given official recognition.

LOUISIANA

Personal.—Dr. Charles Chassaignac, dean of the New Orleans Polyclinic, Post Graduate School of Medicine of the Tulane University of Louisiana, has been appointed medical superintendent of the Eye, Ear, Nose and Throat Hospital, New Orleans. For seventeen years Dr. Chassaignac was editor of the *New Orleans Medical and Surgical Journal.*

Hospital News.—New Orleans faces the loss of a gift for a hospital. Mrs. John Dibert made the gift six years ago, for the erection of a tuberculosis hospital in that city. The original gift of $303,000 has increased to $360,000. Since the money was placed at the disposal of the city for the badly needed hospital, site after site for the institution has been selected and as often residents in the section of the city where it was chosen have protested. Dr. Oscar Dowling, state health officer, classed community opponents of locating the hospital as "utterly selfish," and said that their action is based on imaginary fear of infection. Mrs. Dibert stated that, unless some definite action is taken, she will feel justified in asking the return of the money, so that it may be placed where it will be appreciated.

MAINE

Tuberculosis Clinics for Physicians.—The first of two tuberculosis clinics for physicians, planned by the Maine Public Health Association, took place, August 23-24. Speakers included Dr. Eugene R. Kelley, Boston; Dr. Langdon T. Snipe, Bath; Dr. Elmer D. Merrill, Foxcraft; Dr. Joseph H. Pratt, Boston; Dr. Donald B. Armstrong, New York, and Dr. Daniel Fiske Jones, Boston. A similar clinic will be held in the winter.

New England Tuberculosis Conference.—The seventh annual New England Tuberculosis Conference was held in Augusta, September 28-30. Physicians, nurses, public health officials, social workers and interested persons from all over New England were present at the conference. Dr. Elmer D. Merrill, president of the Maine Public Health Association; Dr. Clarence F. Kendall, state health commissioner, and Dr. Langdon T. Snipe, president of the Maine Medical Association, were among the speakers.

MARYLAND

Improvement in Medical Conditions at House of Correction.—At the first meeting of the medical committee appointed by the state board of prison control, a program was drafted which will not only make detailed provision for immediate correction of medical deficiencies at the Maryland House of Correction, but will also outline future needs of the institution. The committee is composed of Dr. Francis Lee Dunham, Dr. Samuel Wolman, Dr. Anton G. Rytina and Dr. Randolph Winslow.

Body of Dr. Halsted Cremated.—Following services which were held at his home, the body of Dr. William S. Halsted, who died, September 7, at Johns Hopkins Hospital, was cremated, September 9, at Loudon Park Cemetery, in pursuance of his wish. Drs. William H. Welch, Howard A. Kelly, William H. Howell, John J. Abel, William G. MacCallum, Harvey Cushing, Ira Remsen, Winford H. Smith, John Whitridge Williams and Judge Harlan were the honorary pallbearers, and Drs. John M. T. Finney, Joseph C. Bloodgood, Hugh H. Young, George J. Heuer, Samuel J. Crowe, Walter E. Dandy and Mont R. Reid were the active pallbearers.

Personal.—Dr. Everard Briscoe, who has been a public school physician, has been transferred to the corps of general health officers, to take the place of Dr. George H. Grove, who recently resigned.——Walter H. Feldman has been appointed laboratory assistant in the Baltimore City Health Department.——Dr. James H. Mason Knox, who has been abroad for the past year acting as general supervisor of child welfare work for the American Red Cross, has returned to Baltimore and will assume his duties as director of the child hygiene bureau of the state department of health.——Dr. Winford H. Smith, director of the Johns Hopkins Hospital, has resigned as a member of the municipal hospital commission appointed to select a site for the new hospital for communicable diseases and to assist in the preparation of plans for the institution. The ground for Dr. Smith's resignation is that, although the commission was expected to advise and aid in drawing up plans for the hospital, it was not permitted to do so, and only on completion of the plans was it allowed to inspect them.

MASSACHUSETTS

Employees May Select Physician.—At a meeting of the Franklin District Medical Society, recently, action was taken in the matter of industrial concerns which hand their employees printed cards telling them to employ certain physicians when they are injured. It was voted to send communications to the newspapers, advising industrial employees of their right to employ any physician they chose, regardless of any effort on the part of their employer to influence them otherwise, as stated under the general laws of the Workmen's Compensation Act.

MICHIGAN

Medical Men Protest Nursing School Plans.—The *Michigan State Medical Journal* has attacked the proposed new university training school for nurses, in its entire separation from the medical school. A divided authority in the medical school and the university hospital is not favored. As a wartime measure, hospital and medical schools were under separate authorities, but with the understanding that the hospital would be again placed under the jurisdiction of the medical school as soon as the war was over; but the medical school and university hospital have continued as separate units, with the dean of the medical school having no supervision over the hospital, and Director Parnall, supreme power in the hospital, answerable only to the board of regents. Last spring a recommendation was presented to the board signed by practically every member of the medical faculty, asking that the old order be returned. The regents did not grant this request.

MINNESOTA

Mental Research Bureau.—A central research bureau in mental deficiency has been established by the state board of control. The functions of this bureau will be to make all examinations in mental deficiency called for in the commitment of patients to the several institutions, and to conduct a free mental clinic in the St. Paul office, and such other clinics in the state as means may permit. The staff of the bureau consists of the former staff of the research department of the Minnesota School for the Feeble-Minded, the latter department having been discontinued.

Psychopathic Hospital Urged for University.—Establishment of a psychopathic hospital at the University of Minnesota, in order to give Minnesota medical students an opportunity to study and diagnose the treatment of mental disease, will be recommended to the next legislature. Dr. Arthur F. Kilbourne, medical superintendent of the Rochester State Hospital, states that medical students of the university have little opportunity to study diagnosis and treatment of mental cases, and points out that the hospital would relieve the congestion of the state hospital and also train nurses for mental cases. An appropriation for such a hospital came before the last legislature, but was defeated.

MISSOURI

Hospital News.—The Methodist Hospital, St. Joseph, will ask for bids about September 15, on a $1,000,000 building, plans for which are now being drawn.——Mr. and Mrs. J. W. Freeman have established a hospital at Joplin to be operated under the direction of the Protestant churches. A drive for $50,000 for new equipment is planned.——The Frisco Employees' Hospital, Springfield, will erect a hospital building at a cost of $800,000.

Free Surgical Treatment.—Surgical treatment was given free at all the hospitals in St. Joseph, September 19-20, in connection with the clinic which preceded the thirty-fifth annual meeting of the Missouri Valley Medical Society. All persons who needed surgical attention were requested by the society to apply for admission to the hospital of their choice. This was the first of a series of surgical clinics which the profession hopes to hold two or three times a year.

Faculty Changes at St. Louis University.—Dr. David H. Dolley, formerly pathologist at the University of Missouri, has arrived at the St. Louis University School of Medicine to assume his duties as head of the department of pathology. Dr. Hugh P. Muir of Harvard University will be instructor of pathology. Both the dental and the law school will occupy new buildings this year. Dr. Hanau W. Loeb, dean of the medical college, has announced that in response to the urging of the medical associations of the country, the restriction as to freshman classes of only 100 has been lifted. As a consequence more than 140 freshmen have already registrated for the fall term.

NEBRASKA

Reunion Clinic.—Forty physicians and surgeons attended a clinic at the University of Nebraska Hospital, September 12, in connection with the thirteenth annual reunion of the alumni association of the University of Nebraska College of Medicine. Dr. Gerald Webb, Colorado Springs, Colo., spoke on "Epidemiology of Tuberculosis" and Dr. John J. Keegan spoke on "Brain Surgery."

NEVADA

Maternity Act.—The Sheppard-Towner Maternity Act has been accepted for the state of Nevada by the governor, bringing the total number of state acceptances to forty-two. The Federal Board of Maternity and Infant Hygiene has approved the plans of thirty-three states for applying the initial funds allotted them under the act.

NEW HAMPSHIRE

New Hampshire Public Health Association.—A special meeting of the council of the New Hampshire Medical Society, held, June 29, sponsored a movement to organize a public health association in the state. This was followed by a meeting in Concord, September 13, when a committee of medical men was appointed to initiate a movement for the establishment of a statewide organization to promote public health activities. A campaign for the enrolment of the men and women in the state interested in all the many phases of the movement will be inaugurated. Dr. H. L. Smith, Nashua, president of the state medical society, has invited the committee to be his guests at the Nashua Country Club for the first meeting, at which organization plans will be discussed. This meeting will be held early in October.

NEW JERSEY

Banquet for Sanitary Inspection Officer.—His co-workers and friends will give a testimonial dinner in Newark, October 5, in honor of Andrew J. Brady, chief of sanitary inspection of the department of health. Mr. Brady has recently completed thirty years of service with the department.

NEW MEXICO

Relief Bill for Physician Passed.—A bill passed the Senate, September 2, authorizing the Secretary of the Treasury to pay the sum of $750 to Dr. Charles LeRoy Brock, government physician at the Northern Pueblo Agency, for the loss of his motor car in a flood while responding to an emergency call among the Indians.

NEW YORK

Rehabilitation for Tuberculosis Patients.—Under the provisions of the will of Miss Ida Potts, the purpose of Ida Potts Memorial Hospital to be erected in Columbia County shall be not only to arrest disease, "but to provide opportunities for training and employment in gainful occupations, thus leading to the economic as well as the physical rehabilitation of the patients." Miss Potts' will, besides the gift of $150,000 for purchasing a site and erecting the necessary buildings, makes available the income from $1,250,000 for the maintenance of the institution. The institution will have at the outset accommodations for forty patients. Under the provisions of the will, only ambulatory patients and patients whose cases have a favorable prognosis will be accepted.

Personal.—Major Adna G. Wilde, West Point, has resigned from the M. C., U. S. Army, and will open an office at Vicksburg, Miss., as a specialist in ophthalmology, otology, rhinology and laryngology.——Dr. Grace Kimball and Dr. Elizabeth B. Thelberg, Poughkeepsie, recently sailed on the *Majestic* for Cherbourg and Southampton.——Dr. Aaron J. Rosanoff, formerly clinical director of Kings Park State Hospital, Long Island, has located in Los Angeles, where he will specialize in neuropsychiatry.——Lillian Segal Kopeloff has been appointed in charge of the newly established research department of biologic chemistry at the Psychiatric Institute of the New York State Hospital, Ward's Island.——Dr. Richard B. Gray has resigned as city health officer of Rensselaer. He will remove to Bayside, L. I.

New York City

Mammoth Drug Raid.—On the night of September 22, Dr. Carleton Simon, special deputy police commissioner in charge of the narcotic division, raided what is believed to be the headquarters of an international drug ring, at 207 West Fortieth Street. About $500,000 worth of morphin, cocain and heroin were seized. There is evidence that this is the principal wholesale distributing center from which drugs are shipped to the South and West.

Personal.—Dr. Frederick H. Albee, New York, sailed on the *Mauretania*, September 26. He will return, October 12. Dr. Albee has been invited to open the discussion on "Bone Graft Surgery" at the Medical and Surgical Congress of France, to be held in Paris, October 2-7.——Dr. Means S. Gregory and Dr. Charles B. Meding returned from Europe, September 17.——Dr. Alexis Carrel, New York, recently returned from his annual vacation on his farm in France.——Dr. Andrew J. Gilmour, New York, has just returned from France, Italy and Switzerland, where he climbed the Matterhorn and Mont Blanc. Dr. Gilmour was the first to reach the summit of the mountain now known as Mount Edith Cavell, which he succeeded in doing, Aug. 5, 1915, the day on which Miss Cavell was arrested.

NORTH CAROLINA

Tuberculosis Association Meeting.—The North Carolina Tuberculosis Association will hold its annual meeting in Goldsboro in October under the direction of Dr. Lewis B. McBrayer of Sanatorium. Dr. Charles L. Minor, Asheville, has been appointed chairman of the medical section.

State Leads in Birth Statistics.—North Carolina has the highest birth rate, 29.2, for the first quarter of 1922 of all the thirty states named in the provisional mortality figures of the department of commerce, according to a report just issued. For the states compared, the total birth rate for the first quarter was 23.3 in 1922 as against 25.3 in 1921. The lowest rate is that of Washington, 16.5.

OKLAHOMA

New Dairy Ruling.—A new health regulation forcing all dairies with more than twelve cows to install steam sterilization plants will be enforced in Oklahoma City, it has been announced by the commissioner of public safety. This rule was made as the result of a recommendation by the city chemist of Oklahoma City.

OREGON

Hospital News.—Active building operations will soon be started on the Portland Shriners' Hospital for Crippled Children. This hospital, in which children of all races, creeds and colors will be treated free, will be erected on a large site facing Sandy Road and Eighty-Second Street.——A surgery for which funds were donated by Mrs. Amanda Clark as a memorial to her husband was formally opened, September 9. It is attached to the Good Samaritan Hospital, Portland, and contains seven operating rooms and a series of sterilizing rooms. It is equipped with modern surgical appliances.

RHODE ISLAND

New Buildings for State Infirmary.—It is announced by Dr. Henry Jones, superintendent of the state infirmary, Howard, that new buildings are under construction at that institution. This will enable the hospital to have roentgen-ray service with the present laboratory.

TENNESSEE

Weekly Health Letters to Be Issued.—The state board of health, in conjunction with the U. S. Public Health Service, will issue a series of weekly letters pertaining to malaria. These letters will be published in the county papers in the western division of the state where malaria is prevalent.

VIRGINIA

New Chair at Medical College.—The board of visitors of the Medical College of Virginia by unanimous vote have added a course in military tactics and science. Dr. Charles Wallace Sale, major, M. C., U. S. Army, has been appointed to the professorship of this chair.

Honor Memory of Physician.—More than $2,000 has been raised by friends of the late Dr. Godfrey L. Miller, Winchester, for the purpose of erecting a memorial. This will take the form of a granite fountain to be erected near the Frederick County court house. Dr. Miller was in charge of all the Confederate hospitals in Winchester during the Civil War.

New Unit for University Hospital.—Plans are nearly completed for a new unit to the University of Virginia Hospital. This addition will be located south of the present buildings and will conform in structure to the north wing building. It will house the obstetric and orthopedic departments. This addition was made possible by the $50,000 gift of Paul McIntire. It is hoped to complete the building by April, 1923.

WISCONSIN

Bequest to Medical School.—Under the will of Mrs. Harriet L. Cramer, widow of the late owner of the *Evening Wisconsin*, the arts and science department of Marquette University receives $100,000 and the Marquette University Medical School receives approximately $1,000,000.

CANADA

New Medical Society.—The Hamilton (Ont.) Mental Hygiene Society was recently organized in that city under the auspices of the Hamilton Medical Society. Major-Gen. S. C. Newburn, M. P., was elected president of the society. It is estimated that the first year's expenditures will amount to $4,000, as a salaried social worker and also a secretary will be employed by the society.

Hospital News.—The Montreal Shriners, in a report to the Rameses Temple, Toronto, say the city authorities there have finally enacted the necessary legislation to permit the erection of the hospital on the plot of ground heretofore selected by the committee, purchase of which has been held up because existing ordinances prohibited the building of a hospital in that area. The site for the hospital for crippled children has now been purchased, and the plans are being prepared. ——The mayor of Toronto recently laid the corner stone of the new nurses' home at the Riverdale Isolation Hospital, Toronto, in the presence of a large gathering of nurses and physicians.

Personal.—Dr. H. Rundle Nelson, who for several years has been in charge of the quarantine station at William Head, B. C., was recently appointed radiologist at St. Joseph's Hospital, Victoria, B. C.——Dr. W. Edward Gallie of Toronto has been appointed to the advisory board of the Shriners' hospitals for crippled children.——Dr. A. Mackenzie Forbes of Montreal has been appointed surgeon-in-chief for the Shriners' Montreal hospital for crippled children.——Dr. John G. Fitzgerald, Toronto, is touring in Europe.——Prof. Irving H. Cameron, Toronto, recently attended the meeting of the British Medical Association in Scotland.——Dr. John H. McConnell, Toronto, has been elected a member of the Corporation of Trinity College to succeed the late Dr. George A. Bingham.——Dr. James Hanley has returned to Toronto from Germany.——Dr. D. E. S. Wishart has returned to Canada after having taken extended courses in Boston, Edinburgh and London during the last two years.——Dr. John W. S. McCullough, Toronto, has returned from England.

PHILIPPINE ISLANDS

Rockefeller Foundation Work in the Philippines.—In a report submitted to Governor Wood, Dr. Victor G. Heiser, far eastern representative of the Rockefeller Foundation, he outlined the progress of the work since his arrival in that country three months ago. The University of the Philippines has been improved by revision of the college curriculum. A central nursing school that will double the number of trained nurses graduated annually in the Philippines has also been established. Dr. Heiser recommended that the health activities be centralized under one department secretary. A bill to that effect failed of passage in the last legislature, but it is expected that it will be brought up again this year. The International Health Board has furnished the services of Dr. Charles N. Leach to the Philippine government for health work; Dr. W. S. Carter, as assistant dean of the college of medicine and surgery and professor of physiology, and Miss Alice Fitzgerald as consultant in nursing. A sanitary engineer was furnished to undertake field studies in malaria, which have already been instituted in the province of Laguna.

PORTO RICO

Medical Association of Porto Rico.—The annual meeting of the association will be held in Ponce, December 15-17, under the presidency of Dr. P. Gutierrez Ingaravidez of San Juan. Boats for Porto Rico leave New York every Saturday and average four to five days on the trip.

GENERAL

Association of Military Surgeons of the United States.—The thirty-first annual meeting of this association will be held in Washington, D. C., beginning October 12, under the presidency of Capt. F. L. Pleadwell, M. C., U. S. Navy. Delegates from the naval services of Great Britain, Canada and Spain will be guests of honor at the meeting.

Journal of Outdoor Life.—With the August issue, the National Tuberculosis Association legally assumed ownership of this journal, which was formerly published by the Journal of the Outdoor Life Publishing Company. It is the official organ of the National Tuberculosis Association, and Dr. James Alexander Miller is editor-in-chief. No immediate change will be made in the journal, it is announced.

New Health Crusade Manual.—The Modern Health Crusade literature of the National Tuberculosis Association has been extensively revised, and the 1922-1923 editions for the school year are now available. This edition of the manual gives a completely graded course in crusade work from the kindergarten through the junior high school grades. The course for junior high school grades will this year include organized community sanitation work.

Milbank Memorial Fund.—The technical board of the Milbank Memorial Fund held a conference at Paul Smith's, Adirondack Mountains, August 20, to discuss the best means of using Mrs. Elizabeth Milbank's bequest of $10,000,000 in a statewide fight against tuberculosis. Drs. Livingston Farrand, Hermann M. Biggs, Donald B. Armstrong and Otto R. Eichel attended the conference. Mrs. Milbank contributed much to aid the late Dr. Edward L. Trudeau in his campaign of education against tuberculosis.

Medicines Receive Priority Shipping Right.—For some time various railroads have included medicines among the products against which an embargo was placed. Consequently, it was stated, the supply of drugs was endangered in certain eastern and southeastern railroad districts. As a result of protest, the Interstate Commerce Commission has entered an order, effective September 21, that certain commodities, among them medicines, shall be given preference and priority by such common carriers as railroads.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons.—At the thirty-fifth annual meeting of the association, held in Albany, N. Y., September 19-21, the following officers were elected for the ensuing year: presi-

dent, Dr. Gordon K. Dickinson, Jersey City, N. J.; vice presidents, Drs. George V. Brown, Detroit, and James A. Harrar, New York; treasurer, Dr. William G. Dice, Toledo, and secretary, Dr. James E. Davis, Detroit. The next annual meeting will be held in Philadelphia, Sept. 19-21, 1923.

An Act for Relief of Physician's Widow.—A bill passed the Senate, September 9, providing for the payment to the widow of Dr. Rudolph H. von Ezdorff, surgeon and a commissioned officer of the U. S. Public Health Service, the sum of $4,500, on account of the death of her husband, this sum being the amount of salary and allowances for one year. His death was caused by myocarditis, contracted as a sequel to an attack of yellow fever incurred in the line of duty while he was engaged in suppressing an epidemic of yellow fever in Mississippi in 1898.

American Public Health Association.—The fifty-first annual meeting of the American Public Health Association will be held at Cleveland, October 16-19, with headquarters at the Hotel Statler. The following sections will conduct programs: public health administration, laboratory, vital statistics, sanitary engineering, industrial hygiene, food and drugs and child hygiene. There will also be special programs on public health publicity and public health nursing. Reduced railroad fares will be available to members of the association. For further information, address the secretary of the association, 370 Seventh Avenue, New York.

To Eradicate Disease Among Herds.—At the annual meeting of the American Veterinary Medical Association, facts were placed before the convention showing that tuberculosis among cattle has been greatly reduced and is now comparatively light. In thirty-seven states, composing 46.2 per cent. of the area of this country and containing more than 40 per cent. of the cattle of the country, there is less than 1 per cent. of tuberculosis. J. A. Kiernan, chairman of the International Tuberculosis Committee, stated that complete eradication of the disease among cattle is a practical possibility. From July 1, 1917, to June 30 of this year, 175,000 tuberculous cattle were destroyed in this country.

Mississippi Valley Medical Association.—The annual meeting of the association will be held in Rochester, Minn., October 10-12, under the presidency of Dr. Charles E. Barnett of Fort Wayne, Ind. Dr. Frank Kidd of London, England, will open the genito-urinary symposium. A special rate of a fare and a half has been authorized for the meeting and the Chicago and Great Western Railroad will have a special train for those going through Chicago, leaving the Grand Central Station at 8 p. m., October 9, and reaching Rochester at 7:30 a. m., October 10. This meeting precedes the Minnesota State Medical Association meeting, which will be held in Minneapolis, October 12-14, thus affording an opportunity to attend both sessions.

American Child Hygiene Association.—The thirteenth annual conference of the association will be held in Indianapolis, October 12-14. Delegates from all parts of the United States will gather there to discuss the various phases of child hygiene work. Herbert Hoover, president of the association, and Sir Auckland Geddes, British ambassador to the United States, will give addresses at the meeting. Organized in 1909 as the American Association for the Prevention of Infant Mortality, which later became the American Child Hygiene Association, the organization has seen in the thirteen years of its existence a decrease of 42 per cent. in the infant mortality rate of the United States. Public interest is shown in the membership list of nearly 2,500, representing 350 affiliated societies in the principal cities of the United States.

New Regulations on Prohibition—Prescribing Intoxicating Liquor and Compounds Containing Liquor.—Following are such portions of Treasury Decision 3395 as are of interest to physicians in the prescribing of alcoholic beverages:

To Federal Prohibition Directors and Others Concerned:

2. Section 69 of Regulations 60, as amended, is further amended to read as follows:

PRESCRIPTIONS ON OFFICIAL BLANK

(c) Liquor may be sold as such on prescription only when and if the prescription is written on an official blank, Form 1403, and otherwise conforms to the requirements of Article XIII as amended, including the requirement that the name of the druggist shall be written on the prescription in the *physician's handwriting* (italics ours): Provided, however, that emergency prescriptions conforming to Section 77 (f) may be filled. A pharmacist employed by any person other than a retail druggist may not fill prescriptions for liquor. Every pharmacist must, at the time of filling a prescription for liquor, indorse on the prescription over his signature the word "Cancelled," together with the date the liquor is delivered. The druggist must preserve in a separate carefully guarded file each prescription so filled.

POSSIBLE VIOLATION—NO REFILLS

(d) No prescription may be filled which does not conform to the limitations set out in Section 77 (b) as amended. A prescription for liquor should not be filled if the druggist or pharmacist has a reason to believe that the patient would thereby (on prescriptions from the same or different physicians) secure a quantity of liquor in excess of the amount permissible under said Section 77 (b). A prescription written by a physician for his own use should not be filled. A prescription for liquor may not be refilled.

LABEL ON CONTAINER

(e) In every case where liquor is sold on a physician's prescription, there must be affixed to the immediate container thereof a label showing the following:

1. Serial number of prescription blank.
2. Name and address of the retail druggist.
3. Name of the patient.
4. Name of the physician.
5. Kind and quantity of intoxicating liquor.
6. Proof, if liquor is spirituous, if vinous, the percentage of alcohol.
7. Date prescription is filled.
8. Directions for use.

LIQUORS USED IN COMPOUNDING

(f) Distilled spirits, wines or alcoholic medicinal preparations fit for beverage use may be used by a retail pharmacist, or a retail druggist acting through a pharmacist employed by him, in compounding medicinal preparations on physicians' prescriptions or otherwise, subject to the quantity limitation of Section 64. If such medicinal preparation is compounded for stock, contains no more alcohol than is necessary for extraction, solution and preservation, and is unfit for beverage use, it may be sold for medicinal purposes only without the necessity of receiving a permit to purchase or a prescription on Form 1403; but if such preparation compounded for stock is fit for beverage use, or contains more alcohol than is necessary for extraction, solution and preservation, it may be sold only (1) pursuant to prescription on Form 1403, or (2) pursuant to and upon receipt of permit to purchase, Form 1410 A.

PRESCRIPTIONS NOT REQUIRING OFFICIAL BLANK

(g) The prescription for a medicinal preparation unfit for beverage use need not be written on the official blank, Form 1403, even though potable distilled spirits (whiskys, rum, gin, brandy, etc.) or wine is to be a component part of the prescribed compound, but the person or persons filling such a prescription (including both the pharmacist and druggist, when the pharmacist is employed by the druggist) will be held strictly accountable for the sufficiency of the medication to render the compound unfit for use for beverage purposes, and such a prescription may not be filled unless the pharmacist (or the pharmacist and druggist where the pharmacist is employed by the druggist) is entirely satisfied that the compound is unfit for such beverage use. Furthermore, on any such prescription the physician must have shown the name and address (including the state and city or other local designation, and the street and number, if any) of (1) the patient, (2) the physician, and (3) the pharmacist (or retail druggist acting through the pharmacist) filling the prescription.

(h) The prescription described in paragraph (g), containing potable distilled spirits as a component part thereof, may not be refilled; when filled it shall be cancelled, filed in a separate file, recorded, reported, etc., in the manner described in paragraph (c) and elsewhere in the regulations with respect to official prescriptions.

REDUCING PROOF OF LIQUOR

(i) The proof of liquor used either in filling prescriptions for liquor as such or as an ingredient of a compound shall not be reduced by the druggist either before or at the time of filling, except as indicated by the prescription, and except that spirits other than alcohol may be reduced to 100 degrees proof, and at the time the prescription is filled alcohol may be reduced to any appropriate proof.

SPECIAL TAX

(j) Retail druggists or pharmacists selling intoxicating liquors as such or compounds fit for beverage use, whether upon physicians' prescriptions or otherwise, are required to pay special tax as liquor dealers under the internal revenue laws, and to keep special tax stamps conspicuously posted.

3. Section 77 of Regulations 60, as amended, is further amended to read as follows:

WHO CAN PRESCRIBE?

Sec. 77 (a) A physician who has filed application, Form 1404, and obtained a permit to prescribe intoxicating liquor, as provided in Article III, may prescribe distilled spirits, wines or such alcoholic medicinal preparations which are fit for use for beverage purposes as are authorized to be manufactured by Article XI, for a person upon whom he is in attendance, if after careful physical examination of such person (or in a case in which such examination is impracticable, upon the best information obtainable) the physician in good faith believes that the internal or external use of such liquor as a medicine by such person is necessary and will afford relief to him from some known ailment. A physician who does not hold a permit to prescribe may not issue such a prescription.

LIMITATION ON PRESCRIPTIONS

(b) No prescription may be issued for a greater quantity of liquor than is necessary for use as a medicine by the person for whom it is prescribed in the treatment of an ailment from which such patient is known by the physician to be suffering. No prescription shall be issued for internal or external use by any person within any period of ten days for (1) more than a pint of spirituous liquor, (2) any vinous liquor which contains more than 24 per cent. of alcohol by volume, (3) more than 1 quart of vinous liquor, or (4) any such vinous or spirituous

liquor, or both vinous and spirituous liquor containing more than one-half pint of alcohol.

(c) Physicians are not permitted to write prescriptions for intoxicating liquor for their own use, or to use any liquor procured upon prescriptions issued by them. Liquor procured upon prescription may only be used for medicinal purposes by the person for whom prescribed and may not be sold or otherwise disposed of by him.

OFFICIAL BLANKS

(d) Prescription blanks, Form 1403, are issued by the commissioner in serially numbered books of 100 blanks each, and may be procured free of cost from the director by any physician holding a permit to prescribe. The blanks are engraved on specially designed water-marked paper, the serial number of the book being shown on each form and also each form being serially numbered from 1 to 100 within the book. Not more than one prescription book shall in any case be issued or furnished by the director to the same physician at one time, nor shall more than one book be issued during any period of ninety days unless the physician shall show to the satisfaction of the Commissioner of Internal Revenue, in the manner hereinafter provided, that for some extraordinary reason additional prescription blanks are necessary.

NEW BLANKS

(e) If the physician has exhausted a book issued to him or it is apparent that the number of blanks remaining therein will not be sufficient to meet his legitimate needs during the period of ninety days from the date of receipt of the book, and in the opinion of the physician an extraordinary cause renders necessary the furnishing to him of more prescription blanks during such period, he may file with the director of his state an application addressed to the Commissioner of Internal Revenue, for additional blanks, supported by a verified statement of the extraordinary cause believed by him to exist, and any other evidence he may see fit to submit. The director will investigate the circumstances set forth by the physician as warranting the issuance of additional blanks, and will promptly forward the documents received from the physician to the Prohibition Commissioner with the director's recommendation of approval or disapproval of the application of the physician for additional blanks. If the Commissioner of Internal Revenue shall find upon such written application and recommendation that the physician is entitled to additional blanks, the Prohibition Commissioner will advise the director accordingly, and the director shall thereupon issue the additional blanks to the physician.

EMERGENCY PRESCRIPTIONS

(f) No physician shall issue any prescription for liquor not on the prescribed form, and no druggist or pharmacist shall fill such prescription, except that in the case of an epidemic or a sudden and unforeseen accident or calamity, a physician holding a permit to prescribe may issue a prescription for intoxicating liquor upon a form other than 1403 where failure to issue such prescription might result in loss of life or intense suffering, but such a prescription shall describe fully the accident, calamity or circumstances constituting the emergency because of which the unofficial blank is used. Such emergency prescription must be prepared in duplicate and reported each month to the director as provided in paragraph (g). All prescriptions for liquor, whether on the official blank or otherwise, must be written in duplicate, both copies signed by the physician, and must contain all the data called for on Form 1403.

STUB OF BLANKS

(g) The prescription blanks issued by the commissioner are printed with stubs attached, the stub of the blank being a duplicate thereof. The books containing the stubs or duplicate copies of prescriptions issued on Form 1403 must be returned to the director from whom secured immediately upon the last prescription blank contained therein being used, or earlier if so directed by the commissioner or director. Any unused, mutilated or defaced blanks remaining in the book (or in the possession of the physician) must be returned therewith. The duplicate copies of prescriptions written on other forms in emergency cases must be forwarded to the director at the end of the month in which issued. In all cases blanks, Form 1403, must be used in the order of the serial numbers printed thereon.

(h) Before issuing any book of physicians' prescription blanks, a director may, whenever it is deemed advisable, have stamped across each blank in the book with a rubber stamp, the name of the state in which the book is issued. When prescription books so stamped are lost or stolen, it will be necessary to issue warnings only throughout the state in which the books were issued.

(i) A prescription for a medicinal preparation unfit for beverage use need not be written on the official blank, Form 1403, but such a prescription must conform to the limitations of Section 69 (g) as amended. The physician need not write such prescription in duplicate, and is not required to keep a record thereof other than such record as he keeps for other prescriptions pursuant to local law or practice.

PERMANENT RECORDS

(j) Every physician who prescribes intoxicating liquor is required to keep in book, Form 1402, a record alphabetically arranged of every prescription for intoxicating liquor issued by him, showing the date of the prescription, the amount and kind of liquor prescribed, the name and address of the patient to whom issued, the purpose or ailment for which prescribed, and the directions for use thereof, including the amount and frequency of the dose.

(k) The director should check all copies of prescriptions returned to him, for the purpose of determining whether any physician is violating the terms of the permit issued to him, or whether any person is procuring through one or more physicians excessive quantities of liquor.

(l) All returned books, Form 1403, should be numerically filed by the director.

D. H. BLAIR,
Commissioner of Internal Revenue.

LATIN AMERICA

Quarantine in Tampico.—The United States Health authorities have declared a quarantine against Tampico because of yellow fever, it is reported from Mexico City. Yellow fever conditions at Tampico are not considered serious, but the U. S. Public Health Service is taking all necessary precautions to prevent the disease reaching this country.

FOREIGN

Italian Villa Restored to Kraepelin.—The *Policlinico* relates that the Italian government has decided to restore to the German psychiatrist, Prof. E. Kraepelin, his villa in Italy, which was confiscated during the war as enemy property. Our exchange adds, "This is in tribute to the internationalism of science."

German Society for Study of Heredity.—The German Society für Vererbungswissenschaft is holding its second annual meeting in Vienna this week. Baur of Berlin delivers an address on the aims and task of the scientific study of heredity from both the practical and the theoretical standpoints. The meeting was preceded by the two-day international celebration of the Mendel centennial at Brünn.

International Tuberculosis Union. — The International Union Against Tuberculosis, which recently held its session in Brussels, has announced that the 1926 meeting will be held in the United States in connection with the sesquicentennial of Philadelphia. The next meeting will be held at Berne, Switzerland, in 1924. Dr. Theobald Smith, director of the Rockefeller Foundation animal research laboratory at Princeton, N. J., is president-elect for the American conference.

Conference on Milk in France.—The state departments of agriculture and of hygiene organized what they called the *Journée du lait*, September 19, at Paris. The subjects appointed for discussion were: the expense and profits of dairying; means to reduce the price and improve the grade of milk; regulation of its sale, and hygiene of its transportation, each topic to be opened by an expert in that special line. Pinard was one of the vice presidents of the conference.

New Medical Association.—The Australian and New Zealand Medical Association in England has recently been organized in London, to assist with information or advice, medical visitors from those countries traveling in Europe. The association is open to all medical graduates or undergraduates, born in Australia or New Zealand and resident or visiting in England. Mr. E. T. C. Milligan, F.R.C.S., and Mr. Bedford Russell, F.R.C.S., are the honorary secretaries of the society.

Armenians Honor American Physicians.—Four American physicians have recently been made honorary members of the Medical Society of Armenia, in recognition of their work in connection with the Near East Relief in that country. Of the four physicians, two are women, sent by the American Women's Hospital Association. These are Dr. Elfie Graff of Vassar College, now serving in Karaklis, in charge of the child welfare clinics, and Dr. Mabel E. Elliott of Benton Harbor, Mich., stationed at Alexandropol, in charge of the largest medical unit in the Near East, which cares for more than 20,000 children and thousands of refugees. The other physicians honored are Dr. Rowland P. Blythe of Cranford, N. J., district physician of Kazachi Post, the boys' orphanage accommodating 7,000 at Alexandropol, and Dr. Russell T. Uhls of Kansas City, in charge of the medical work at Seversky Post, Alexandropol.

Next International Congress of the History of Medicine.—At the recent international congress at London, it was decided to accept the invitation of the Medical Society of Geneva, Switzerland, and hold the next meeting there in 1925. The first congress of the kind was held at Antwerp in 1920, the second at Paris in 1921. The long interval before the next meeting is to be bridged by a congress on the history of science in general, which is to convene at Brussels in 1923. Among the historical subjects treated were the interest of and the part taken by physicians in the early days of aeronautics. Another point brought out was that the great hospitals of the middle ages owed their inception to the plague. Dr. Krumbhaar of Philadelphia described the first teaching of anatomy in the United States, and Dr. Comrie the same in Scotland. A number of hitherto unknown medical works of historic interest were described, in particular a thirteenth century Latin translation of the "Sixth Book of Epidemics," described by Mrs. Singer. See also London Letter, August 19, p. 671.

Personal.—Dr. L. Cheinisse of Paris, a collaborator on the *Presse médicale*, author of innumerable collective reviews on the topics of the day for that journal and for its predecessor, the *Semaine médicale*, has been decorated as a chevalier of the Légion d'honneur. Our French exchanges are congratulating him, saying that he is one of the most *documentés* medical journalists of France, although of Russian birth.——The *Medicina Ibera* relates that Dr. Faustino Frean of Macegoso, Spain, has had to have his right arm amputated on account of poisoning from a scratch received while operating in a case of purulent pleurisy.——Dr. Knud Faber, professor of clinical medicine at Copenhagen, received many tributes on his sixtieth birthday, August 29.——Dr. Hans Virchow, professor of comparative anatomy at Berlin, reached his seventieth year, September 10, not many months after his father's centennial had been celebrated throughout the world. His special field of research has been joints and ligaments. He is president of the Berlin Anthropologic Society.——Dr. Neuschloss of the Pharmacology Institute at Frankfort has been called to take charge of the Institute for Experimental Research at Buenos Aires.

The German Council on Pharmacy and Chemistry.—Our German exchanges report that the Arzneimittelkommission is at work and doing good service. The *Klinische Wochenschrift*, for instance, gives some queries presented to the commission by the board of health of a large city, the officials of a health insurance society and a physician. They inquired in regard to various "patent medicines." The commission's replies point out specifically the danger of giving medicines the formula for which is not given, and the expense of giving an iodid, for instance, in a proprietary when the officinal drug is so much cheaper, and there is no proof that the former is more effectual. The report states further that a certain proprietary recommended as treatment for tuberculosis of the bowel contains mercury, and that to give this in unknown dosage is dangerous, and it is directly dangerous to give mercury with tuberculosis of the large intestine. One proprietary alleged to be a mixture of mercury, and an extract of bee glands is said to be dangerous because it might prevent diphtheria antitoxin treatment. One of the proprietaries inquired about is a contraceptive, and the commission advised against its sale under any circumstances. Another is a mixture of gonad extract and yohimbin. The advertising was said to make exaggerated claims while silent on the amounts of the active substance. The commission advised decidedly against allowing this to be marketed.

Meeting of the Medical Women's International Association.—The third meeting of the Medical Women's International Association, of which Dr. Esther P. Lovejoy of New York is president, was held at Geneva, Switzerland, as previously announced, September 4-7, and nineteen countries were represented. Many of the eighty medical women present were official delegates from various medical organizations. The main discussions were on problems which can be best solved by international cooperation, namely, treatment and prevention of venereal disease in its relation to the state, the white slave traffic, and cocain and other drug traffic. A resolution was passed strongly urging the League of Nations to insist on government control of both the manufacture and the sale of cocain. The British and the French contingents entertained all the delegates, and at a banquet representatives of each of the nineteen countries made brief addresses. Among the speakers were Dr. Mary Scharlieb, as representative of Great Britain; Lady Barrett, as president of the federation of British Medical Women; Dr. Grace Kimball of Poughkeepsie, N. Y., president of the National Association of Women Physicians of the United States, and Dr. Eliza Maria Mosher of Brooklyn, who was graduated in 1875. At the first meeting of the association in 1919, at New York, only fifteen nations were represented. The constitution accepted is to be ratified at a conference of the association to be held in London next year. Dr. Kate C. Mead of Middletown, Conn., was the European secretary for the meeting. All the medical women mentioned above from the United States are Fellows of the American Medical Association.

Deaths in Other Countries

Dr. **William Thomas**, Birmingham, England; emeritus professor of anatomy, Queen's College, Birmingham; surgeon to the Children's Hospital, and the Orthopedic and Spinal Hospital; pathologist to Queen's Hospital; died recently, aged 82. In 1888, he was appointed Ingleby lecturer, and he was formerly president of the Midland Medical Society.——Dr. **James Donelan**, laryngologist, Italian Hospital, London, aged 66.

Government Services

Public Health Service to Investigate Cyanid Deaths

Preliminary reports have reached the U. S. Public Health Service headquarters at Washington from San Francisco relating the death of five employees of the U. S. Public Health Service from cyanid fumes, while they were engaged in the work of fumigating the Japanese steamship *Shinyo Maru* in San Francisco harbor. The real cause of the disaster will be determined by official investigation, but it is assumed that the deadly cyanid was released by one of the workers before all were prepared to leave the hold of the ship. This is the second disaster of the kind occurring this year at San Francisco, and will no doubt be the occasion for added impetus to the investigations and experiments now being conducted by the Public Health Service in the new methods of ship fumigation. A recent discovery is cyanogen chlorid gas, which is possessed of the qualities of high toxicity for rodents and vermin of all kinds, warning properties, noncorrosive and noninjurious to fabrics and foods.

Appropriation for Walter Reed Hospital

An appropriation bill was passed by the House of Representatives before adjournment, carrying $44,109 for the purchase of additional property for the medical museum and library of the Walter Reed General Army Hospital in Washington, D. C. Congress originally appropriated $350,000 for acquiring 150 lots needed for extensions at the hospital, but this sum was exhausted and an additional amount was necessary to buy the property needed.

Surgeon-General Cumming to Go Abroad

Dr. Hugh S. Cumming, Surgeon-General of the U. S. Public Health Service, leaves, October 5, for Europe to spend two weeks inspecting the government's sanitary stations abroad. While in France, General Cumming will also attend the convention at Paris which is to revise the international sanitary treaty of Rome, where he will present several amendments concerning international measures against typhus, the plague and cholera. He will attend, in addition, the meeting in Paris of the hygiene unit of the League of Nations, in order to give that body the benefit of his experience in matters of safeguarding public health through inspection and quarantine of persons entering this country.

Health Posters for the Navy

During August the bureau of medicine and surgery of the U. S. Navy has forwarded to all ships and stations a set of posters dealing with general, personal and social hygiene. If such posters are found to be of educational value, new posters dealing with the prevention of disease and accidents will be forwarded to ships and stations from time to time. In addition to posters, the bureau of medicine and surgery has prepared lantern slides on health which will be used at the regular motion picture shows. A twelve-reel film, entitled, "The Science of Life," will be forwarded to the commander-in-chief of the Atlantic fleet and later another to the commander-in-chief of the Asiatic fleet.

Army Medical Officers Assigned to Medical Schools

Officers of the Medical Corps of the Army have been assigned to special courses of instruction at various universities in the United States as follows:

Lieut.-Col. Will L. Pyles and Major Paul R. Hawley, public health and hygiene, Johns Hopkins University, Baltimore.

Major Henry C. Dooling, internal diagnosis, Mayo clinics, Rochester, Minn.

Major John B. Anderson, neurology and psychiatry, University of Pennsylvania, Philadelphia.

Major John E. Walker, bacteriology, pathology and preventive medicine, Johns Hopkins University, Baltimore.

In addition to the foregoing, the following officers of the Medical Corps already are pursuing special courses of instruction:

Major Henry C. Michie, internal medicine, University of Vienna.

Major Edgar F. Haines, urology, Massachusetts General Hospital, Boston.

Capt. William C. Munley, internal medicine, London, England.

Foreign Letters

PARIS

(From Our Regular Correspondent)

Sept. 8, 1922.

Deficiencies in the Instruction in Pathologic Anatomy in France

Dr. G. Poujol, professor of pathologic anatomy at the Faculté de médecine et de pharmacie of Algiers, recently published in the *Gazette des hôpitaux* an important article on instruction in pathologic anatomy in French medical schools. The evils from which this instruction is suffering have their origin chiefly in difficulties that arise in connection with necropsies performed in the hospitals. Ordinarily, relatives of the deceased are opposed to a necropsy. The regulations in force at the present time offer every facility for such opposition to arise. In the hospitals of Paris, not only ascendants and descendants in direct line, the surviving spouse, the brothers and sisters of the deceased, have the legal right to refuse to permit a necropsy but also the uncles and aunts, nephews and nieces. Sometimes opposition develops from other sources. For example, it is the rule at Algiers that no necropsies shall be performed on paying patients, those who were members of the hospital personnel or wards of the public charities. In the case of Jews who have no surviving relatives, certain religious organizations intervene to prevent the necropsy, paying, if need be, all hospital charges.

It would be of great advantage for the reorganization of instruction in pathologic anatomy if it should prove possible to overcome, to a large extent, this opposition to postmortem examinations. Without violating public sentiment, we can endeavor to influence this sentiment and to promote the view that necropsy is something that goes without saying. For this purpose it would be necessary to secure the cooperation of the administrative boards. In their work on the Technique des autopsies, Drs. G. Roussy and P. Ameuille refer to the fact that around 1840 it was held that postmortem examinations in hospitals should be regarded as a matter of course, in the interest of patients and science. At that time, administrative boards favored the performance of necropsies. Why is that not the case today? The right of refusing to permit a necropsy might be restricted to the father, mother, sons, daughters, brothers and sisters of the deceased, excluding all more distant relatives.

But the most important of the reforms that Poujol would like to see realized would be for the hospital services to abandon the performance of necropsies, with the understanding that all postmortem examinations should be entrusted to the anatomicopathologic service. That is the system in vogue in all countries except France. The advantages of the system are: All, not merely part, of the necropsies are performed and that by a specially trained personnel; they are methodical and complete; all the observations gathered in the hospital services are supplemented by an indispensable anatomic record; as regards instruction, the students have every day an opportunity to witness necropsies and to perform them themselves, thus familiarizing themselves at first hand with all types of lesions, and, last but not least, the records of the findings from day to day are placed on file in the anatomicopathologic institutes, and constitute an almost inexhaustible fund of information for the elaboration of scientific treatises. It is the system adopted not only in Germany, but also in England, the United States, Italy, Switzerland, Belgium, Russia and elsewhere.

Poujol proposes another innovation. He would like to see an obligatory two months' course in necropsy work introduced, which might take the place, during this period, of clinical instruction. Such a course would be open to students of the fourth year, and would constitute a part of the instruction in pathologic anatomy.

In one medical school the instruction in pathologic anatomy is such that these reforms are unnecessary; namely, the University of Strasbourg. Nowhere else in France are there available such opportunities for progress in pathologic anatomy as are found at Strasbourg.

Poujol recommends that no further buildings for the use of the medical faculty be erected detached form the hospitals.

Writing for the Blind in Ordinary Characters

Since, in 1826, Louis Braille introduced the method of writing for the blind that bears his name, this system has become known in every country of the globe. It has, however, two defects: (1) It is written from right to left and is read from left to right, and (2) the characters are of a peculiar, special type, which constitutes a much greater drawback, since only those who have made a particular study of them can read them. To remedy these disadvantages, a system of writing in ordinary characters that could be read by all, at the first glance, without special preparation, was needed. It goes without saying that such a system would have to be based on raised points or dots, since the fingers of the blind find difficulty in deciphering cursive writing. The system of writing proposed by Dr. A. Cantonnet and simplified by the French canon Nouet has the great merit of so generalizing the method that it is applicable not only to the Roman characters but also to the Greek, the Slavic and the Hebrew, the raised points being made in the shape of the letters.

The national congress to promote the welfare of the blind, at its regular session, July 21, 1922, adopted a resolution demanding that the system of Cantonnet and Nouet be taught in the schools for the blind, in addition to the classic braille. In writing this system, the same instruments are used as for the braille.

LONDON

(From Our Regular Correspondent)

Sept. 4, 1922.

Annual Meeting of the British Association

The annual meeting of the British Association took place at Hull. Distinguished representatives of science from foreign countries—Belgium, Denmark, France and Sweden—were present. Dr. E. B. Mathews represented the American Association for the Advancement of Science. As has been the rule since the war in scientific gatherings, no German or Austrian representative was present. The retiring president, Sir Edward Thorpe, called attention to the hardship inflicted on students by the greatly increased cost of textbooks. The president, Sir Charles Sherrington, F. R. S., professor of physiology in the University of Oxford, in an address entitled "Some Aspects of Animal Mechanism," referred to the exquisite mechanism by which the blood is kept relatively constant in chemical reaction despite the variety of the food replenishing it, and the fluctuating draft from it. Similarly, various postures were maintained by reflex action in the absence of the higher nerve centers.

MIND AND MATTER

Turning to the old enigma of the relation of mind and matter, he said that mind becomes more recognizable, the more developed the nervous system. Hence the difficulty of the twilight emergence of mind from no mind, which is repeated even in the individual life history. Mentality was not distributed broadcast through the nervous system, but in the higher vertebrates was restricted to the newer parts of the forebrain. The mental part of the nervous system was so placed that its commerce with the body and the external

world occurred only through the archaic nonmental part of the nervous system. Simple nerve impulses, their summations and interferences, seemed the one uniform office of the nervous system in its nonmental aspect. To pass from a nerve impulse to a psychic event was, as it were, to step from one world to another and incommensurable one. We might expect that the brain would exhibit striking changes of structure at the place of transition from its nonmental to its mental regions. But no; there were the same old structural elements set end to end, suggesting the one function of the transmission and collision of nerve impulses. The interconnections were richer, but that was merely a quantitative change. Can we attach any meaning to the fact that mind is localized in the nervous system? The nervous system has had the office from its earliest appearance onward throughout evolutionary history more and more to weld together the body's component parts into one mechanism reacting as a unity to the changeful world about it. In that system mind, as we know it, had its origin. From small beginnings its seat, the cortex of the forebrain, had become steadily a larger and larger feature of the nervous system until in man it dwarfed all the rest. The mental attributes of the nervous system were the coping stone of the construction of the individual. But they did not stop at the individual; they integrated individuals into communities. Reviewing the distribution of mind within the range of animal forms, we met with two peaks of development—in insects and in the vertebrate (with its acme in man). In the insect the type of mind was not rational but instinctive; in man there was reason as well as instinct. Yet in both one outcome was the welding of individuals into societies. In many of its aspects, animal life presented a mechanism the how of which, despite many gaps, was fairly explicable. It was as explicable as was the working of a gas engine or an electromotor. But other aspects, such as the shaping of the animal body, the conspiring of its structural units to compass later functional ends, the predetermination of specific growth from egg to adult, the predetermined natural term of existence, we are still at a loss to understand, despite many brilliant inquiries and inquirers. The steps of the results are known, but the springs of action still lie hidden. Then, again, the how of the mind's connection with its bodily place seemed an utter enigma.

The Deaths from Botulism

The deaths from botulism of eight persons—six guests at a hotel in the highlands and two gillies who accompanied them on a fishing expedition from a highland hotel—were reported a fortnight ago. These are the first cases of botulism observed in this country, and their uniform fatality to eight persons, most of whom were in excellent health and in the prime of life, has produced a profound sensation throughout the country. The health authorities are holding an exhaustive investigation. It has been shown that the potted meat responsible was confined to one or two pots of wild-duck paste, which were supplied by one of the leading firms in the country. The same brand had been used at the hotel for twelve years without any incident. The medical officer of the food department of the Scottish board of health stated in his evidence that food factories generally were well conducted. He would prefer to see the date of manufacture stamped on tins and jars, as it would enable a particular consignment to be traced. Asked how long hermetically sealed food kept, he stated that he had eaten a can of Maconachie rations issued in the Boer War without ill effects. Dr. McFadden, chief medical officer of the food department, ministry of health, said that he had visited the factory where the potted meat was made in London, and saw the whole process. The meat passed through a heat equivalent to a pressure of 10 pounds of steam before potting, and through a temperature of 210 F. after potting, besides the heat of cooking. Everything was satisfactory, and the cleanliness and intelligence of the workers were remarkable. Asked to suggest any step by which the poison might be killed, he said that complete sterilization would do this, but that this ideal had never been attained. He would suggest raising the thermal point in the final process and leaving the meat longer under the heat. A bacteriologist gave evidence that rabbits and mice, fed on fragments of the potted-meat sandwich found in a dead gillie's box and on the wild-duck paste, evinced symptoms of botulism. It was announced that an antitoxin for botulism will be available in the principal cities. On behalf of the manufacturers of the potted meat, the bacteriologist was asked: What is the thermic point at which *Bacillus botulinus* is killed? The reply was from 140 to 160 F., but that the spores required a temperature of 248. The bacteriologist considered that the one weak point in the process was the interval between the second and third heatings. That was the danger interval. The manager of the firm who produced the potted meat said that the output was a million jars yearly, and that this was the first complaint ever received about the product. The presumption was that only one pot was affected, as 700 others of the batch in question were sold. Game was specially sterilized, both on arrival and as paste. The coroner's jury found that there had been no negligence, but recommended that all preserved foods should have a distinctive mark by which details in manufacture could be traced. One result of the fatalities is that underwriters at Lloyd's are issuing policies to hotel and boarding house proprietors covering them against legal liability for the death or injury of guests due to food supplied to them.

Fewer Medical Students

In 1920, 2,531 medical students were registered, and in 1919 the number was no less than 3,420. These figures are the expression of an upward tendency since 1913, which was exaggerated by a wave following the war. But in the last completed medical year the number fell to 1808, little more than half that of 1919. This fall has taken place in anticipation of the overcrowding of the profession, which is calculated to begin in 1925.

Industry's Death Roll

The annual report of the chief inspector of factories and workshops shows that during 1921 there were 92,565 accidents (951 fatal), as compared with 138,773 (1,404 fatal) in the previous year. This remarkable drop is almost entirely due to the phenomenal inactivity in industry throughout the year and the prolonged coal strike, which resulted in many iron mills and blast furnaces being closed down. These industries are heavy producers of accidents. The number of accidents due to electricity was 322 (thirty-two fatal), a reduction of 20 per cent. The welfare movement in factories and workshops has held its own in face of adverse circumstances. Before 1914, welfare schemes were in operation in comparatively few factories. The war produced an unprecedented interest in the welfare of the workers, when it was realized that on them, as much as on the soldiers, our existence depended. Now reports from inspectors all over the country show that in addition to canteens, cloak rooms, surgeries and rest rooms—matters dealt with in welfare orders—a large number of social activities—saving clubs, benevolent clubs, concerts and dance meetings, summer camps in charge of athletic trainers, bowling greens, dental clinics, libraries, schools and lectures—have been organized. During the year there were 230 cases of lead poisoning, of which twenty-three were fatal. There were no cases of phosphorus or mercury

poisoning, but one case of arsenic poisoning. The lower figures for anthrax poisoning (twenty-five, of which six were fatal) are partly due to the inauguration of the government station at Liverpool for disinfecting wool. On the question of the forty-eight-hour week, it is stated that since this has been established and the reduction of hours has been continued over a considerable period, output tends, in the majority of cases, to attain the old level, and the beneficial effect of the increased leisure on the workers is becoming apparent. The plan of "no work on Saturday" appears to be increasing in favor.

MADRID

(From Our Regular Correspondent)

Aug. 12, 1922.

Senator Blocks Passage of New Public Health Law

The hopes of all those interested in hygiene and sanitary improvement were based on the new public health law, prepared by the best Spanish sanitarians. At the closing session of congress, the president of the senate called up the bill for passage. The pending law organizes and regulates the services of country physicians, granting them more responsibility. This, however, clashes with the platform advocated by others. An organization composed ostensibly of rural physicians succeeded in getting the ear of a senator, Sr. Sánchez y Sánchez, and when all the physicians who are members of the senate were rejoicing at the prospective passage of the bill, Sánchez arose and, taking advantage of the legal provision granting to any senator the right to ask for an absolute majority of affirmative votes before any law is approved, delivered a speech on the subject. He began by admitting that as he was entirely ignorant of the matter he would not even touch upon it, but as he had engaged himself to block the passage of the law, he would exhaust all his resources in combating it. Lacking better arguments, he expressed his intention of taking up the remaining hours of the session reading Don Quixote, which he did, for four hours. Could Cervantes ever suspect that his glorious creation would serve to block the sanitary progress of his country? The same evening that a senator prevented this advance in public health, members of congress approved, by a few votes, an increase in their salaries from 500 pesetas ($75) to 1,000 pesetas ($150) a month. Much disappointment is felt at these parliamentary happenings.

French Physicians Pay Official Visit to Spanish Universities

French physicians, representing the medical schools of Bordeaux, Lyons, Montpellier, Paris, Strasbourg and other cities, headed by the dean of the Paris Medical School, Dr. Roger, and the dean of Montpellier, Dr. Forgue, have come to Spain to visit the medical schools of Barcelona, Valencia, Valladolid and Madrid. Everywhere, members of teaching staffs and physicians in general have welcomed them cordially. In Madrid, they received many testimonials of regard, which they accepted with evident pleasure. The National Academy of Medicine held a special session in their honor and appointed Professors Roger and Forgue as corresponding members. At the Madrid Medical School, the lecture by Professor Roger on the influence of organic extracts on the circulatory system was received with much applause. Professor Forgue spoke before the National Academy of Medicine, setting forth the achievements in French surgery during and after the war. The Madrid Medical Society gave the French physicians a banquet at the Ritz Hotel, and two days afterward met again to listen to a lecture by Professor Mauriac on leukotherapy, in which he discussed the modern conceptions of leukocytes and their activities and therapeutic uses. It was interesting to note the opinions formed by the French physicians as to Spain and Spanish medical science, as a result of their visit to this country. All of them bore testimony to the efforts made by Spanish physicians to raise the cultural status of the profession. What surprised Spanish physicians most was the admiration shown by their foreign confrères for the spirit of cooperation prevailing among Spanish physicians, which they deemed most worthy of imitation. The *entente cordiale* exhibited in all places visited by them, among professors and practicing physicians, and the organization of the Colegios de Médicos (medical societies), to which all practicing physicians must perforce belong, and having in all provincial capitals their own offices or homes, attracted much attention. French physicians found an analogy between this institution and their own barristers' guilds. At all the capitals as well as the universities visited, the French travelers were heartily welcomed. The prominent place filled by physicians in Spain, both in society and in politics, greatly impressed the foreigners, who noted the fact that, in Spain, all universities are represented in the senate, their representatives often being medical professors. The French physicians were also much pleased at the many statues erected to physicians in Spain, considering them as a sort of testimonial to the virtues which must raise the physician above the common level in order to lead the people on the road to health and to watch over the life of his fellow citizens.

BERLIN

(From Our Regular Correspondent)

Aug. 26, 1922.

New Provisions for the Combating of Tuberculosis in Prussia

The legislature of Prussia has under consideration a bill pertaining to the campaign against tuberculosis, one of the main provisions of which will extend the application of compulsory notification of tuberculous patients. Every case of pulmonary and laryngeal tuberculosis must be reported to the proper authorities, either orally or in writing, within a week—deaths within twenty-four hours. Obligation to make the report rests on the attending physician, or, if no physician is consulted, on the head of the household. If the patient changes his (or her) residence, the change must be reported at once, either orally or in writing, by the head of the household, to the public health officer for the district, the report to contain both the old and the new address. If, with the change of residence, also the head of the household changes, the obligation to make the report rests on the former head. If, for any reason, the head of the household is prevented from making the report, the communication must be made by the patient. With reference to cases and deaths occurring in hospitals, sanatoriums, maternity homes, prisons and similar institutions, the superintendent of the institution or some person designated by the public health officer must make the report. The authorities must on request furnish, gratis, blanks for written reports. A public health officer must convey to the welfare center of a district information in regard to a patient's leaving his district, and, in certain cases, to the public health officer in charge of the district to which the patient is moving. The bacteriologic laboratory must report every positive finding, with regard to tubercle bacilli in sputum, not only to the physician who sent in the specimen but also to the public health officer and the welfare center having jurisdiction. On request of the attending physician or of the public health officer of the district, it becomes incumbent on the local police department to cause a fumigation of a patient's apartments to be made, which must be carried out according to the specifications of the

ordinance pertaining to disinfection. If the cost of disinfection of any articles would be incommensurate with their intrinsic value, the local police authorities have the power to order them destroyed. All expenditures that the local public health officer has to make in carrying out the provisions of this bill, if it becomes a law, must be borne by the state. The cost of fumigation and disinfection will be paid from public funds only in case the patient is financially unable to assume the expense. A fine, not to exceed 1,500 marks, will be imposed on those (1) who culpably neglect the provisions in regard to notification, as contained in Sections 1 to 3 of the bill, and (2) who use or allow others to use, before they have been disinfected, any rooms or movable property which, according to Section 8 of the bill, have been declared by the police authorities to be subject to disinfection.

Adjustable Air Pressure Chamber for Operations on the Lungs

An adjustable air pressure chamber for lung operations has been established in the operating room of the Munich surgical clinic. The atmospheric pressure in the chamber is reduced by 100 mm. of mercury by means of an exhauster, it being possible to graduate the rarefaction according to need. The head of the patient lies outside of the chamber. The patient's body is within the chamber, where the operator also takes up his position. Air sluices are employed to allow persons to enter the chamber or to take in utensils. Bell signals and a telephone are used for communication between the operator and the anesthetist.

MEXICO CITY

(From Our Regular Correspondent)

Sept. 17, 1922.

Yellow Fever

From July 28 to Sept. 15, 1922, eleven new cases of yellow fever with six deaths have been reported. Seven of the cases were at Pánuco and the others at Tampico, the latter town being infected from the former. This new outbreak of yellow fever—the last case had been in March, in the southern part of the state of Vera Cruz—may be explained through the existence of endemic centers at some small towns. As there are usually no physicians in such communities, the infection is kept alive by children and nonimmune adults from other places. A real diagnosis is made only when an outsider gets sick and is attended in some medical center, and thus the infective focus is located. On other occasions, the first cases are overlooked, as the usual diagnosis is "hemorrhagic malaria," a disease which is generally neglected, and thus the existence of cases of yellow fever is unknown until the patient is finally seen by some painstaking clinician. Besides enforcing prophylactic measures most rigidly, it has been decided to make malaria a notifiable disease whenever hemorrhages occur during the course of the disease. Thus, an end will be made of an anomalous situation, as suspicious cases will be carefully investigated and laboratory tests made, and epidemic outbreaks will be discovered and controlled in time.

Seventh Mexican Medical Congress

Because of several obstacles, the organizing committee of the medical congress to be held at Saltillo was forced to postpone the inauguration date to September 23. The congress will close on the 29th. So far, about 300 physicians have announced their intention of attending, and a number of them will submit papers. It is expected that this meeting will be a complete success both because of the large attendance and the prevailing enthusiasm among physicians, and because of the moral and material assistance rendered by the national government and the state of Coahuila.

Marriages

EUGENE MORRISON CARR, Detroit, to Miss Catherine Creighton of Blue Ridge Summit, Pa., recently.

ROB ROY DOSS, Richmond, Va., to Miss Olivette Rosalie Field of Washington, D. C., recently.

HARRY GOLDSTEIN, Spokane, Wash., to Miss Elizabeth Bruers of Portland, Ore., recently.

CHARLES ANTHONY HEIKEN, Philadelphia, to Miss Gladys Howell of Bellefonte, Pa., recently.

VAN NOYES VERPLANCK, New York, to Miss Charlotte Vincent of Baltimore, September 2.

JOHN W. HUSTON, Salem, Ore., to Miss Elizabeth B McFarland of Portland, recently.

PAUL JOHN LEWIS, Yakima, Wash., to Miss Ruth Jones of Iron Mountain, Mich., recently.

FRANK J. MILLOY, Phoenix, Ariz., to Miss Ola Sue McCabe of Columbus, Neb., September 9.

JAMES A. BUTIN, Fredonia, Kan., to Miss Bernice Walker of Kansas City, Mo., July 26.

JAMES FELL CARRELL to Miss Anna Elise Hartman, both of Philadelphia, September 9.

ARTHUR M. DANNENBERG to Mrs. Marion L. Stein, both of Philadelphia, August 21.

HENRI S. BELAND to Miss Van Laethem, both of Ottawa, Ont., Canada, July 20.

SAMUEL JACOB ALDEN to Miss Helene Smith, both of Chicago, September 9.

JOHN J. CARROLL, Jordan, Mont., to Miss Mary G. McHale of Butte, August 9.

HOWARD A. WEIS to Miss May Disert, both of Iowa City, August 31.

Deaths

Horatio Robinson Storer, Newport, R. I.; Medical School of Harvard University, Boston, 1853; died, September 18, aged 92, from senility. Dr. Storer was the son of Dr. David Humphreys Storer, a former president of the American Medical Association. He was graduated by Harvard University in 1850. Following his graduation from Harvard Medical School in 1853 he went to Europe for further study, serving as assistant to Sir James Simpson of Edinburgh. On his return to America Dr. Storer studied law and received the degree of LL.B. from Harvard. During 1865-1869 he was professor of obstetrics and medical jurisprudence at Berkshire Medical College, and later lectured on gynecology. In 1865 Dr. Storer received the Gold Medal and a prize of $100 from the American Medical Association for his essay on "Physical Evils of Forced Abortions." In the same year he served as assistant secretary of the American Medical Association and in 1868 was elected vice president. In 1869 he served in a like capacity for the Gynecological Section at the Ninth International Medical Congress. Dr. Storer was founder and for many years editor of the *Boston Journal of Gynecology* and president of the Boston Gynecological Society. He had also served as life president of the Newport Medical and Natural History societies, which he founded. He was a member of the Massachusetts and Rhode Island Medical societies, of the American Academy of Arts and Sciences, Boston Society of Medical Observation, Massachusetts Benevolent Society, American Public Health Association, American Numismatic Association, the Medico-Chirurgical Society of Edinburgh, and corresponding member of the Geographical Institute of Pernambuco, the obstetrical societies of Berlin, Edinburgh and London, of the New York and Rhode Island medicolegal societies; an honorary member of the California State Medical Society, the Canadian Medical Association, the Medical Society of New Brunswick, the medical societies of Finland and Sorrento, Italy, and several Canadian and foreign medical, obstetric and numismatic societies. He was also founder of the Newport Sanitary Protection Association and the Harvard Club of Rhode Island. Dr. Storer was Harvard's oldest living graduate. Among other contributions to the literature he pub-

lished "Criminal Abortion in America," 1859; "Why Not?—A Book for Every Woman," 1865; "Is It I?—A Book for Every Man," 1869; and, with Sir William O. Priestley of London, "Memoirs and Contributions of Sir James Y. Simpson," of Edinburgh, 1855. Dr. Storer devised a number of surgical and gynecological instruments and methods. He was prominent as a numismatist and had written many papers on medical medals and tokens. On his ninety-first birthday the people of Newport presented him with a gold loving cup in recognition of his half century of public health work.

Manly Hale Simons, captain, M. C., U. S. Navy ● St. Helena, Calif.; University of Michigan Medical School, Ann Arbor, 1871; died, August 29, aged 73, from heart disease. Dr. Simons was born in Genoa, N. Y., July 11, 1849. He entered the navy, May 28, 1872, and was retired, July 11, 1911. During the Spanish-American War, Dr. Simons served on the U. S. S. *Iowa* and *Philadelphia* as fleet surgeon. He was on shore duty at various navy yards and hospitals at the U. S. Naval Academy and in command of hospitals at Philadelphia and Mare Island, Calif., being medical director on recruiting duty from April 7, 1917, to Feb. 14, 1919.

Walter Fremont Church ● Greeley, Colo.; College of Physicians and Surgeons, Baltimore, 1893; Rush Medical College, Chicago, 1899; at one time coroner and county physician of Weld County; served in the M. C., U. S. Army, during the World War with the rank of captain; honorably discharged, December 7, 1918; died, September 11, aged 57, from heart disease.

Frederick Solon Crossfield ● Hartford, Conn.; Bellevue Hospital Medical College, New York, 1879; formerly president of the Hartford County Medical Society; member of the American Academy of Ophthalmology and Oto-Laryngology and the New England Otological and Laryngological Society; died, September 18, aged 68.

William A. Weldon, San Pedro, Calif.; Medical School of Maine, Portland, 1884; member of the Medical Society of the State of California; formerly county coroner and police surgeon; at one time health officer; died, September 7, aged 58, following a long illness.

Jay Livingstone Greene, Eagle, Colo.; Denver College of Medicine, 1886; member of the Colorado State Medical Society; formerly county physician and health officer; died, August 6, at Salida, aged 83, from pneumonia, following an operation.

George Victor Litchfield, Jr. ● Abingdon, Va.; Johns Hopkins University, Medical Department, Baltimore, 1902; served in the M. C., U. S. Army, with the rank of captain, during the World War; died suddenly, August 29, aged 45, from heart disease.

John Brien Adkerson, Union City, Tenn.; Vanderbilt University Medical Department, Nashville, Tenn., 1901; member of the Tennessee State Medical Association; died, August 27, at Dawson Springs, Ky., aged 50, from uremia.

McDugald Keener McLean, Asheville, N. C.; Johns Hopkins University, Medical Department, Baltimore, 1915; author of "Tuberculosis—A Primer and Philosophy for Patient and Public"; died, September 8, aged 36.

Adelaide C. Duncan ● Chicago; Woman's Medical School of Northwestern University, Chicago, 1895; member of the American Academy of Ophthalmology and Oto-Laryngology; died, June 24, aged 56, from bronchial asthma.

Joseph Edward Rhoads, Jr., Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; also an optician; died, September 9, aged 44.

Alice H. B. Milligan, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; died, September 4, aged 48, at the Woman's Hospital.

Arthur Franklin Bradshaw, Bieber, Calif.; Jefferson Medical College, Philadelphia, 1893; served in the M. C., U. S. Army, during the World War; died suddenly, September 3, aged 52, from cerebral hemorrhage.

Curtis Abram Overholt, Ada, Ohio; Cleveland Homeopathic Medical College, Cleveland, 1898; aged 50; died suddenly, from cerebral hemorrhage, August 26, while driving his automobile in Toledo, Ohio.

George W. Gloyd, Branson, Mo. (licensed, years of practice); member of the Missouri State Medical Association; Civil War veteran; formerly city health officer; died, July 19, aged 78, from appendicitis.

John Wesley Trueworthy, Los Angeles; Rush Medical College, Chicago, 1865; member of the Medical Society of the State of California; formerly coroner of Lyons County, Kan.; died, September 10, aged 79.

John Richard Slattery ● Boston; Medical School of Harvard University, Boston, 1891; superintendent of St. Elizabeth's Hospital; aged 55; died suddenly, September 11, from heart disease.

Herbert John Keenan ● Boston; Medical School of Harvard University, Boston, 1894; formerly member on the school board; died suddenly, September 7, aged 51, from heart disease.

John Morgan Lowery, Poplar Bluff, Mo.; Barnes Medical College, St. Louis, 1903; member of the Missouri State Medical Association; aged 50; died in a hospital at St. Louis, September 5.

Julian J. Stone, Hawkinsville, Ga.; University of Georgia Medical Department, Augusta, 1898; member of the Medical Association of Georgia; died, September 1, aged 49, from tuberculosis.

Robert Lawner Barrow, San Antonio, Texas; University of Tennessee College of Medicine, Memphis, 1914; member of the State Medical Association of Texas; died, September 8, aged 34.

Albert Garland Hayes ● Coldwater, Tenn.; Medical Department University of Tennessee, Memphis, 1901; served in the M. C., U. S. Army, during the World War; died, September 3, aged 42.

Jesse H. Logan, San Antonio, Texas; Beaumont Hospital Medical College, St. Louis, 1892; member of the State Medical Association of Texas; died, June 20, aged 71, from pneumonia.

Benjamin Henton Brown ● Muskogee, Okla.; Rush Medical College, Chicago, 1907; served in the M. C., U. S. Army, during the World War; died, September 9, aged 46, from pneumonia.

Jesse Romulus Ballance, Bolivia, N. C.; North Carolina Medical College, Charlotte, 1912; aged 45; was found dead on the street in Kenansville, recently, from acute indigestion.

John A. Letherman, Coal Center, Pa.; Long Island College Hospital, Brooklyn, 1873; Bellevue Hospital Medical College, 1874; died, September 7, aged 74, at East Pike Run.

James P. Caldwell, St. Paul; Bennett College of Eclectic Medicine and Surgery, Chicago, 1874; Civil War veteran; died, September 7, aged 74, from pneumonia.

John Alphonsus Moore, New York; Bellevue Hospital Medical College, New York, 1887; died, August 31, aged 54, from rheumatic gout and complications.

William Franklin Starley, Sr., Odessa, Texas; Long Island College Hospital, Brooklyn, 1871; died, July 18, aged 78, at Pecos, from gastro-intestinal infection.

Hugh Grant Roberts, Guelph, Ont., Canada; Trinity Medical College, Toronto, Ont., Canada, 1885; formerly city health officer; died, July 11, aged 69.

Isaac Israel Plotz, New York; Columbia University College of Physicians and Surgeons, New York, 1900; died, June 29, aged 48, from thrombosis.

Isaiah Eugene Mullon, New Orleans; Meharry Medical College, Nashville, 1883; died, August 29, aged 86, from uremia and arteriosclerosis.

George F. Rootes ● Tebbetts, Mo.; Missouri Medical College, St. Louis, 1881; died, September 7, aged 65, at Tuscumbia, from heart disease.

Will Augustine Alexander, Schenectady, N. Y.; Albany Medical College, Albany, N. Y., 1890; died, September 10, from cerebral hemorrhage.

Thomas J. Balhatchett, Chicago; Rush Medical College, Chicago, 1891; died, September 16, aged 56, at his summer home in Macatawa, Mich.

James H. Lawhead ● West Newton, Pa.; Jefferson Medical College, Philadelphia, 1886; died, August 13, at the McKeesport Hospital, aged 60.

Elwood C. Heilman, Idagrove, Iowa; Medical College of Ohio, Cincinnati, 1877; died, September 4, aged 66, from angina pectoris.

David R. Carter, Epsom, Ind.; Atlanta Medical College, Atlanta, Ga., 1883; died, September 3, aged 73, from cerebral hemorrhage.

James Simpson, Tucson, Ariz.; Washington University Medical School, St. Louis, 1903; died, September 6, aged 50.

The Propaganda for Reform

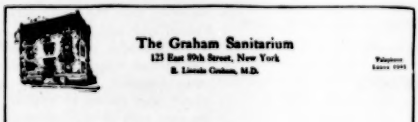
IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

GRAHAM'S NEUTROIDS

The Latest Thing in the Obesity Cure Line

During the past month or two THE JOURNAL has received scores of inquiries from physicians and laymen regarding an alleged cure for obesity put out by one R. Lincoln Graham, M.D., of 123 E. 89th St., New York City. According to the advertising sent out, Graham is "an eminent physician—a stomach specialist who has obtained exceptional honors in his profession." Graham is so "eminent" that most careful search fails to give any information regarding him except that of the briefest biographical nature. He was born in Brooklyn in 1872, was graduated by the Long Island College Hospital in 1893 and is not, and apparently never has been, a member of his local medical society.

The advertising states further that Graham "has written many authoritative medical articles and has lectured before many medical societies." Painstaking search of medical literature for some years past fails to show that Graham has ever contributed a single medical article to any medical journal. The only record in the Association's files relative to Graham's "lectures" before medical societies is some clippings from New York newspapers of December, 1911, recording the fact that Graham had read a paper before the Yorkville Physicians' Society urging that physicians should advertise!



The Graham Sanitarium
123 East 89th Street, New York
R. Lincoln Graham, M.D.

Dear Friends:

Suppose you heard that an eminent physician—a Stomach Specialist who had obtained exceptional honors in his profession—had discovered a remarkable new treatment that would positively remove every ounce of your superfluous flesh.

Suppose that all that it was necessary for you to do was to take a pleasant little tablet three times a day. No restrictions in diet, no exercise, no self-denials of any nature whatsoever.

Reduced reproduction of the opening paragraphs of the form letter sent out to the obese by the "Graham Sanitarium."

One learns further from the present advertising booklet that among the "original articles" alleged to have been written by Graham those on "Yeast Bacteria in the Stomach" are said to have "astonished the medical world by the new light it threw on the cause, remedy and prevention of obesity"—a statement at once preposterous and fantastic.

STUFF AND GROW THIN

Graham claims to be head of "the famous Graham Sanitarium" of New York City, where it is said experiments have disclosed "secrets which scientists have sought for years." These "secrets," it seems, comprise a method by which the obese, though gluttonous and lazy, may reduce without abandoning either gluttony or laziness! To quote:

"Are you fond of sweets? Do you enjoy the foods which have always been thought fattening in the past, such as fat meats, rich gravies, desserts, etc.? Are you a hearty eater?

"Then you will be glad to learn that you may now indulge your appetite to the fullest extent. You may eat all the fats, starches and sweets you wish. You may eat as heartily as you please and as often as you desire. There is absolutely no need to restrict yourself.

"If you have been taking any strenuous exercises in order to reduce, you may abandon them. They are not needed and if carried to excess they might even be harmful."

Graham, we are told, has discovered the "real cause of fat":

"Dr. Graham's discoveries show that obesity is brought about by an over-development of alcohol in the digestive tract."

After Graham had "discovered the real cause of this life-sapping, disfiguring obesity" his next effort, naturally was to devise a remedy that "would neutralize this alcoholic formation." Thus we read:

"Dr. Graham is known both in America and Germany as an authority on Materia Medica. His lectures and writings on medical subjects are studied by Medical Colleges, Medical Societies and physicians in both hemispheres. Therefore, his special knowledge along such lines enabled him, after some lengthy experiments, to devise a remedy made of harmless ingredients which would neutralize and finally prevent the formation of alcohol without interfering in the slightest degree with the digestive system, and without affecting the rest of the body."

THE TESTIMONIAL GAME

And, of course, the public has no means of estimating the truthfulness of these claims. Graham's marvelous remedy is known as "Neutroid Tablets." Like most "patent medicine" exploiters he makes a pretense of telling the public something about the composition of his nostrum. He publishes what purport to be the "opinions of leading physicians and chemists who have analyzed Dr. Graham's 'Neutroid Tablets.'" The first of these "opinions" is credited to one "Dr. Edwin F. Bowers . . . well known author and lecturer on medical subjects." To those familiar with the history of nostrum exploitation, any testimonial by Bowers should arouse suspicion. Bowers calls himself an M. D., but the American Medical Association's records of graduate and licensed physicians, the most complete extant and based on official data, fail to show that Edwin F. Bowers has ever been graduated by a reputable medical school or is entitled to write M.D. after his name; neither do we find any record of Bowers being licensed to practice medicine anywhere in the United States. Bowers is the gentleman who published an article in *Physical Culture* telling how locomotor ataxia could be cured with a milk diet. Some laymen who wrote to Bowers regarding this "treatment" were told that the data were secured at Macfadden's sanitarium; they were told, too, that the Bioxal Chemical Company of New York City "put out a treatment for ataxia and kindred troubles" called "Bioplasm." Booklet enclosed. The booklet is many years old; readers of THE JOURNAL may remember the exposé of the Bioplasm humbug published many years ago. At that time the president of the Bioplasm Company was one Edwin F. Bowers.

Another testimonial is from Mr. E. H. Gane, Chief of the Scientific Department of McKesson and Robbins. Mr. Gane should know better! Possibly his testimony is due to the exigencies of commercialized pharmacy. A third testimonial is by a "Dr. Henry J. Swoboda, Bacteriologist and Analytical Chemist." We are unable to find any record of Dr. Swoboda either as a physician or as a member of the American Chemical Society.

Bowers, in his testimonial, claims to have found three ingredients in Neutroid Tablets, one of which, according to him, "could be taken by the pound without harm." Another "could be taken in any amount," while the third "one could take at one time a quantity thirty-seven times as large as is contained in one of these tablets." Graham himself declares that his nostrum contains "no thyroid extract, no free iodids . . . or harmful drugs of any kind." Here is what was found in the A. M. A. Chemical Laboratory:

CHEMIST'S REPORT

The weight of Dr. Graham's Neutroids tablets averaged 0.295 Gm. or about 4.6 grains. The odor of the tablets was disagreeable, somewhat like iodin or pyrrol. In the booklet describing the preparation there is no information concerning the ingredients of Neutroids, but much space is devoted to an explanation of what the nostrum does not contain. For example, it is stated on the authority of one Swoboda, who is said to be a bacteriologist and analytical chemist, that "Neutroid Tablets are free from thyroid extract, opium, or its alkaloids morphin and codein, cocain, belladonna and chloral hydrate."

The tablets were nearly insoluble in water but partially soluble in alcohol, ether and chloroform. Alkaloids, ammonium salts, boric acid, emodin-bearing drugs, milk

sugar, nitrates, sulphates, zinc salts and phenolphthalein were absent. Starch and an insoluble substance, probably talc, were present in small amounts and a trace of iron was detected. The bulk of the tablets consisted of magnesium carbonate and an organic iodin compound which responded to tests for iodol, although the product was not pure.

Quantitative analysis indicated that the composition of Neutroids is essentially as follows:

Iodol (impure)	50 per cent.
Magnesium carbonate	43 per cent.
Starch	4 per cent.
Talc	3 per cent.
Iron	Trace

Iodol is a combination of iodin with pyrrol, containing nearly 89 per cent. of iodin. It was described in the U. S. Pharmacopeia VIII, but was dropped in the last edition. It is official in some foreign pharmacopeias. It has been used chiefly as a substitute for iodoform. Iodol is distinctly poisonous, even when applied externally and a number of cases of poisoning are recorded. According to the United States Dispensatory, iodol, if given in sufficient doses to animals "causes emaciation, albuminous urine, fall of temperature, general loss of muscular power and finally death from fatty degeneration of the liver and kidneys." To state that a nostrum containing Iodol is "non-toxic" is false.

The exploitation of R. Lincoln Graham's "Neutroids" follows the classical course of nostrums of this type: First, the buncombe regarding the alleged qualifications of the "discoverer"; then the falsehood that the patient can indulge his appetite to the fullest extent and need not exercise; next the testimonial hocus and, finally, the claim that the "cure" is harmless. Altogether, the product and its exploitation seem to conform strictly to the tenets of the "obesity cure" business.

Correspondence

APPROVAL OF EXPERIMENTAL RESEARCH BY WOMEN'S CLUBS AND BY THE BLUE CROSS

To the Editor:—It is most encouraging that the cause of experimental research is enlisting the sympathy and the aid of the intelligent women of the country. Thus, the women of California have testified to their belief that medical research is not carried on with cruelty; the women of New York City have reechoed this sentiment; and recently the Massachusetts State Federation of Women's Clubs passed the following resolution:

WHEREAS, It is impossible to estimate the number of persons alive today who owe their existence to the application of methods, preventive or remedial, made possible through scientific experimentation on animals; therefore, be it

Resolved, That the Massachusetts State Federation of Women's Clubs, assembled in Boston, on December 15, 1921, in gratitude to medical science for past discoveries beneficial, both to humanity and to animals, go on record as favoring the continuance of medical research through animal experimentation.

It is also encouraging that the American Blue Cross Society, an organization which does for horses, mules and dogs what the Red Cross does for human beings, has given proof that the doors of every one of the eighty-six laboratories for medical research in the United States are open. It has published official statements from the directors of these laboratories that officers of humane societies may at any time enter and see the work in progress.

For more than fifteen years the Committee for the Protection of Medical Research of the American Medical Association Council on Health and Public Instruction, under the able leadership of Dr. Walter B. Cannon of Harvard, have encouraged the "open door" policy. That it has now been universally adopted in the United States is highly gratifying. Not only are the doors of the laboratories open, but the "Rules" safeguarding the rights of animals have likewise been universally adopted, and have been in force for years.

The only specific denial that the laboratories are open, of which I have knowledge, was that by the late Dr. Blackwood of Philadelphia, who declared that, though he was an alumnus of the Medical Department of the University of Pennsylvania, he had been refused admission to the laboratories of that institution four times in five years. Dr. William Pepper, who has been dean of the Pennsylvania Medical School during the past ten years and whose attention was called to this declaration, replied by this telegram:

Philadelphia, June 5, 1922.

Statement that Blackwood was refused admission to University of Pennsylvania laboratories by any one in any position of authority absolutely false. During ten years of my deanship I have never refused any one.
WILLIAM PEPPER.

W. W. KEEN, M.D., Philadelphia.

THE DECLINE IN TUBERCULOSIS

To the Editor:—Referring to the editorial in THE JOURNAL, July 22, allow me to suggest one more extremely important factor: the very general popular phthisiophobia.

Phthisiophobes, lay and professional, undoubtedly exaggerate the danger of the patient, and especially of the "cleanly and conscientious" patient. But their attitude is that of the careful driver who does not try to estimate just what his chance of getting struck by a train at a particular crossing is. They are also, in the essential, qualitative facts, on an absolutely correct scientific basis for: 1. The great majority and the most fatal cases of tuberculosis are of human type and, ultimately, origin. 2. In the great majority of recognizable cases, the patients discharge bacilli in some way and at some times, while many discharge them in enormous numbers, practically constantly. 3. The bacillus has never been shown to require any period of development on its own part or any particular set of circumstances on the part of the environment and the potential victim, for developing a fresh case. It has never been established that any true immunity against infection exists, and the conditions usually accepted as increasing the susceptibility are frequent and commonplace. 4. The hypothetic "cleanly and conscientious" patient is obviously unable to guard perfectly against creating fomites while asleep, in the stage of prostration, or during such common occurrences as sneezing and coughing.

Quite a number of years ago, when the initial diminution of tuberculosis was regarded skeptically, I called attention to a "mathematic" consideration applicable to any infection, notably to tuberculosis and typhoid, whose control was just beginning, but even in retrospect to smallpox. So long as the average individual encounters several or many fomites in a period of increased susceptibility or even in a period used for statistical purposes, there may be a very considerable sanitary improvement in the quantitative sense of diminishing the number of fomites, but the incidence will remain very nearly as great. That is to say, a person run down and with a bad cold for a period of two weeks will be just about as likely to develop tuberculosis if one consumptive sneezes in his vicinity and one gust of wind blows desiccated sputum in his face as if he had encountered a dozen similar opportunities for infection. But, when the reduction of fomites is reduced to unity for an average individual and given period, the law of chance will operate so that many will escape opportunities for infection altogether, while the chances of actual infection are not proportionately increased for those who encounter two, three or half a dozen fomites instead of one. From this point onward, the reduction will be still more rapid—whether literally in a decreasing geometric series or not, I am not prepared to argue; but the reduction will almost certainly be at an increasing rate.

Incidentally, I may say that a consideration of infections serially, in the light of experience, throws considerable doubt

on the generally accepted increase of risk of infection on account of general depression, minor illness, etc. This factor, indeed, seems to be excluded except for tuberculosis and diseases of exotic nature or extreme rarity, for which latter the question of predisposition cannot be answered merely on account of lack of information. I am personally even disposed to be skeptical as to the depressive predisposition for tuberculosis and to ask whether the frequently described "run-down" period before the infection was not really the first reaction of the extant disease.

The element of time, expressed by the rather vague use of the word "period," may require elucidation, or rather, we may not appreciate its importance until we stop to think. A fomes may be in the area of a susceptible individual—admitting for the sake of argument that there are really notable differences in susceptibility—but if not encountered with certain time limits, it becomes innocuous if other circumstances coincide to a favorable result. By this is meant the hour or so stated as the lethal period of direct sunlight; the few days of more or less diffused daylight; the bodily removal of many fomites by street cleaning, vacuum or moist cleaning indoors at intervals; the more or less efficient disinfection by boiling, even washing in hot soap suds, of dishes, table utensils, clothing, etc.; the renovation or destruction of bedding, which is practiced by phthisiophobe hosts to a surprising degree when one considers the expense; and various other natural or artificial processes operating in the direction of disinfection, and efficient if the potential victim is merely delayed in his arrival at the locus of infection.

A. L. BENEDICT, M.D., Buffalo.

"SOME COMPARATIVE RESULTS IN CITIES AND IN COUNTIES AS HEALTH UNITS"

To the Editor:—The article of Dr. A. J. Warren on "Some Comparative Results in Cities and in Counties as Health Units" (THE JOURNAL, July 29, 1922, p. 362) should be of general interest because of the importance of careful consideration of the economic principles involved in public health work. It is of especial interest to me because the author twists into the theme of his paper a quotation from one of my official reports in such a way as to furnish a basis for radical misunderstanding of my attitude toward rural health work.

If it were discovered that, in general, rural health work can be conducted at relatively *less* cost than urban health work of equivalent degree, I should be glad to accept the discovery and use it for whatever it might be worth in the advocacy of county health work. Therefore, my statement that "rural health work, on account of distances to be covered and other obvious factors, is relatively more expensive than urban health work," which Dr. Warren quotes and presents in a very different context from the original, is an expression of my opinion but not of my desire.

Before reading Dr. Warren's paper, it had not occurred to me as likely—or even as possible—that any one with any degree of reason could accept any opinion or opinions I have expressed or helped to spread as "justification for indifference" toward the establishment and maintenance of whole-time rural health service. I have never heard of a single instance in which the opinion expressed by me or others to the effect that rural health work is relatively more expensive and difficult than urban health work has operated as a factor in preventing the establishment or support of county health service. If any such instances are known, I shall be glad to be enlightened with a full account of the circumstances.

My reference to the relative cost of rural health work in the report from which Dr. Warren quotes (p. 18, Reprint 699 from *Public Health Reports*, Oct. 7, 1921) was for the purpose of indicating the importance of cooperation from state and federal governmental health agencies in the rural health field. Thus, it was used in an argument for, not against, the development of local rural health service.

In Dr. Warren's paper, he appears to have confused health work with the results of health work. The statement quoted from my report applies strictly to health activities. The geographical factor alone appears to me to make inescapable the conclusion that most salient health department activities, carried out to the same degree under comparable business management, will necessarily cost more in our average rural community than in our average large city. A discussion of the relative costs of rural and urban health department work, however, impresses me as being largely academic. The big outstanding fact, which I think is "established," is that investment for reasonably adequate local health service in either the rural or the urban community is essential to the public welfare, and is good business.

Throughout the course of my work in the rural health field, I have endeavored persistently and, I think, consistently to convey the idea that the results of reasonably adequate rural health work exceed in value many fold the cost of the work and, therefore, that investments for the support of properly directed rural health work (with the county, or a district comparable to a county, as a unit) are among the very best which can be made from our public or private funds. I think all of my expressions of opinions, if considered by paragraphs instead of by separate words or sentences, indicate my conviction in this respect. Among the first reports I wrote on the subject of rural sanitation or rural health work was one published in Public Health Bulletin No. 94. The conclusions in that report (p. 45) were as follows:

1. Rural sanitation is needed.
2. Rural sanitation is feasible.
3. The cost of work necessary to secure marked advancement in rural sanitation is many times less than the cost of the illness and of the physical inefficiency which will be prevented by such advancement; and, therefore, prolonged, intensive, reasonably directed work for the advancement of sanitation in the rural districts generally of the United States would prove economic.

Those conclusions express the opinion on the subject I now hold and which I expect I would continue to hold if it were established by interesting studies, such as Dr. Warren has begun and which I hope he will continue, that rural health work is relatively either more or less expensive than urban health work.

L. L. LUMSDEN, M.D., Washington, D. C.
Surgeon, U. S. Public Health Service.

DIAGNOSIS OF SYPHILIS FROM PRIMARY LESION

To the Editor:—Referring to the method described by Dr. William D. Gill in THE JOURNAL, September 16, in which serum from the primary lesion is obtained by slight suction obtained from an improvised suction syringe: Serum for dark field spirochetal search may be obtained in a still simpler manner by placing over the lesion any of the ordinary suction tubes, such as those of Hays, Hurd, McQuaid or Waring, connected to a suction pump with mild suction; or if these tubes are unavailable, an efficient suction tube for this purpose may be improvised from the barrel of an ordinary diphtheria antitoxin syringe, inverted and connected to a suction pump by rubber tubing. No new instrument is necessary in this way, and appropriate sized suction tubes are adaptable to nearly all types of lesions, and in situations in which the apparatus suggested by Dr. Gill is difficult or impossible of use, as in the oral cavity or the throat.

J. B. H. WARING, M.D., Blanchester, Ohio.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ACID FRUITS AND ARTHRITIS—BOOKS ON DIETETICS—VITAMINS

To the Editor:—1. Please tell me what relation acid fruits and vegetables bear to the arthritides. 2. What is a good book on disease and dietetics? 3. I should like a list of foods of high vitamin content.

EVA GODDIN CUTRIGHT, M.D., Wooster, Ohio.

ANSWER.—1. So far as we know, there is no positive evidence that the eating of acid fruits and vegetables has a definite effect on the production of arthritis.

2.—

McCollum, E. V.: The Newer Knowledge of Nutrition, New York, the Macmillan Company, 1922.
Friedenwald and Ruhrah: Diet in Health and Disease, Philadelphia, W. B. Saunders Company, 1919.
Eddy, W. H.: The Vitamine Manual, Baltimore, Williams and Wilkins Company, 1921.
Sherman, H. C.: Chemistry of Food and Nutrition, New York, the Macmillan Company, 1918.
Sherman and Smith: The Vitamines, New York, the Chemical Catalogue Company, 1922.

Vitamins and diet are discussed in the following recent issues of THE JOURNAL:

Aug. 13, 1921 (Queries and Minor Notes); Sept. 3, 1921 (Queries and Minor Notes); Feb. 4, 1922 (editorial); March 11, 1922 (Current Comment); March 18, 1922 (editorial); Aug. 19, 1922 (editorial); July 29, 1922 (editorial); May 6, 1922 (Propaganda for Reform, Chart of "Vitamins in Foods"); May 13, 1922 (Hess, Moore and Calvin: Experimental Studies with Proprietary Vitamin Products); April 15, 1922 (Osborne and Mendel, Distribution of Vitamin B in Some Vegetable Foods).

3. A list of foods of high vitamin content will be found in educational poster No. 39, price 40 cents, published by the American Medical Association. The vitamin content of many foods may also be learned by reference to "Vitamins and Their Distribution" (THE JOURNAL, Aug. 13, 1921).

INACTIVATING TEMPERATURES OF ANTITOXINS—LOSS OF POTENCY FOR WASSERMANN TEST OF BLOOD SERUM

To the Editor:—1. What are the maximum and minimum degrees of temperature to which vaccines and antitoxins (diphtheria) can be subjected before losing or impairing their antitoxic qualities? In my practice I am obliged to carry such therapeutic agents for a week or more, often subjecting them to 50 and even 70 F. below zero. 2. What diagnostic value can be placed on the Wassermann reaction of blood serum six weeks after withdrawal? Isolation makes it impossible to get our specimens to a laboratory any sooner.

REX F. SWARTZ, M.D., Noorvik, Alaska.

ANSWER.—1. Vaccines and serums should be kept in a cool, dark place. Usually a constant temperature a few degrees Fahrenheit above the freezing point is recommended as the most desirable. There is no likelihood that freezing vaccines and serum changes or destroys their qualities; it tends rather to preserve their potency; but repeated freezing and thawing would be harmful.

2. Wassermann tests of serum six weeks after withdrawal of the blood have no value unless controlled with tests of serum known to be negative and kept for the same length of time under exactly the same conditions. There is good reason to expect that serum kept frozen solid for six weeks or longer would give reliable results.

TURBAN CLASSIFICATION IN TUBERCULOSIS

To the Editor:—Please describe the Turban method of classification in tuberculosis. EDWARD W. BLAKELY, M.D., Orange, N. J.

ANSWER.—Turban classifies tuberculosis patients wholly with respect to the physical findings. His is an anatomic classification. Stage I includes those patients whose slight lesions do not involve more than one lobe, or two half-lobes. Stage II includes those whose slight lesion extends farther than Stage I, but does not exceed two lobes. A severe lesion involving at the most one entire lobe is also placed in Stage II. Stage III includes those patients not in Stages I and II. "Slight lesion" is synonymous with infiltration, and "severe lesion" with consolidation and cavity formation.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, Oct. 3. Sec., Dr. Ancil Martin, 207 Goodrich Bldg., Phoenix.

ARKANSAS: Little Rock, Nov. 14-15. Sec., Reg. Bd., Dr. G. W. Walker, Fayetteville; Sec., Eclec Bd., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith; Sec., Homeo. Bd., Dr. George M. Love, Rogers.

CALIFORNIA: Sacramento, Oct. 16-19. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

CONNECTICUT: Hartford, Nov. 14-15. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford.

CONNECTICUT: New Haven, Nov. 14-15. Sec., Eclec. Bd., Dr. James E. Hair, 730 State St., Bridgeport; Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 10. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.

FLORIDA: Tallahassee, Oct. 10-11. Sec., Dr. W. M. Rowlett, Tampa.

GEORGIA: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.

HAWAII: Honolulu, Oct. 9-12. Sec., Dr. G. C. Milnor, 401 Beretania St., Honolulu.

IDAHO: Boise, Oct. 3. Director, Mr. Paul Davis, Boise.

ILLINOIS: Chicago, Oct. 10-12. Supt. of Registration, Mr. V. C. Michels, Springfield.

IOWA: Des Moines, Nov. 1-3. Sec., Dr. Rodney P. Fagen, State House, Des Moines.

KANSAS: Topeka, Oct. 10. Sec., Dr. A. S. Ross, Sabetha.

MICHIGAN: Lansing, Oct. 10-12. Sec., Dr. Beverly D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, Oct. 3-5. Sec., Dr. Thomas S. McDavitt, 539 Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 3. Sec., Dr. S. A. Cooney, Power Bldg., Helena.

NEVADA: Carson City, Nov. 6. Sec., Dr. Simeon L. Lee, Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. Alexander MacAlister, State House, Trenton.

NEW MEXICO: Santa Fe, Oct. 9-10. Sec., Dr. R. E. McBride, Las Cruces.

OKLAHOMA: Oklahoma City, Oct. 10-11. Sec., Dr. J. M. Byrum, Shawnee.

PORTO RICO: San Juan, Oct. 3. Sec., Dr. M. Quevedo Baez, Box 804, San Juan.

WEST VIRGINIA: Huntington, Oct. 10. State Health Commissioner, Dr. W. T. Henshaw, Charleston.

WYOMING: Cheyenne, Oct. 9-11. Sec., Dr. J. D. Shingle, Cheyenne.

Oregon Reciprocity Report

Dr. Urling C. Coe, secretary, Oregon State Board of Examiners, reports that during 1922 twenty-four candidates were licensed by reciprocity. The following colleges were represented:

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
College of Physicians and Surgeons, Chicago	(1906)	California
(1909)		Washington
Northwestern University	(1914)	Illinois
Rush Medical College	(1890)	Washington, (1897) Iowa
(1902)		North Dakota, (1916), (1921, 2) Illinois
University of Illinois	(1912)	California, (1913) Idaho
Keokuk Medical College, College of Phys. and Surgs.	(1905)	Iowa
Maryland Medical College	(1911)	Washington
Harvard University	(1920)	Mass.
University of Michigan Medical School	(1916)	Michigan
Ensworth Medical College	(1897)	Illinois
Northwestern Medical College, St. Joseph	(1888)	Nebraska
St. Louis Medical College	(1868)	Kansas
Lincoln Medical College	(1902, 2)	Nebraska
University of Nebraska	(1903)	Nebraska
Jefferson Medical College	(1919)	Penna.
University of Pennsylvania	(1890)	Idaho
Vanderbilt University	(1897)	Texas

Mississippi June Examination

Dr. W. S. Leathers, secretary, Mississippi State Board of Health, reports the written examination held at Jackson, June 20-21, 1922. The examination covered 12 subjects and included 96 questions. An average of 75 per cent. was required to pass. Of the 29 candidates examined, 27, including one undergraduate, passed, and 2 failed. Sixteen candidates were licensed by reciprocity. The following colleges were represented:

PASSED			
College	Year Grad.		Per Cent.
Northwestern University	(1922)*	82, 82, 83, 84, 87,	89
Rush Medical College	(1922)*		86
Louisville National Medical College	(1911)		78
Tulane University	(1922)	84,	89
Mississippi Medical College	(1911)		82

University and Bellevue Hospital Medical College.....(1922)	88, 90
University of Pennsylvania.....(1922)	85, 86, 87, 89
University of Tennessee.....(1922)	87
Meharry Medical College.....(1922)	76, 76, 80, 81, 82, 84
University of Virginia.....(1920)	84, 88
Undergraduate	81

FAILED

Meharry Medical College.....(1922)	67, 71.5

College — LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Louisville Medical College	(1903)	Alabama
University of Louisville Medical Dept.	(1886)	Kentucky
Tulane University	(1901), (1904), (1905), (1920)	Louisiana
(1921) Alabama		
Tufts College Medical School	(1907)	Mass.
University of Minnesota	(1920)	Minnesota
Washington University	(1920)	Tennessee
Cleveland-Pulte Medical College	(1896)	Ohio
University of Pennsylvania	(1920)	New Jersey
Chattanooga Medical College	(1905)	Arkansas
Meharry Medical College	(1920) Georgia, (1921)	Arkansas
University of Tennessee	(1916)	Tennessee

* These candidates have finished the medical course and will obtain the M.D. degree after they have completed a year's internship in a hospital.

Iowa June Examination

Dr. Rodney P. Fagen, secretary, Iowa State Board of Medical Examiners, reports the written examination held at Iowa City, June 1-3, 1922. The examination covered eight subjects and included 100 questions. An average of 75 per cent. was required to pass. Forty-one candidates were examined, all of whom passed. The following colleges were represented:

College — PASSED	Year Grad.	Per Cent.
Northwestern University	(1922)*	90.9
Rush Medical College	(1922)*	91.4
State University of Iowa College of Medicine	(1922)	83.5, 88.3, 88.4, 88.5, 88.9, 89.1, 89.5, 89.6, 89.8, 90, 90, 90, 90.3, 90.4, 90.4, 90.4, 90.4, 90.5, 90.5, 90.5, 90.8, 90.9, 90.9, 91, 91.4, 91.5, 91.6, 91.7, 91.8, 91.9, 92.1, 92.1, 92.3, 92.4, 92.4, 92.5
University of Minnesota	(1922)†	92.2
University of Manitoba	(1921)	92.6

Dr. Fagen also reports that on July 6, 1922, nineteen candidates were licensed by reciprocity. The following colleges were represented:

College — LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Bennett Medical College	(1911)	Tennessee
Northwestern University	(1915), (1921)	Illinois
Rush Medical College	(1921)	Illinois
University of Maryland	(1917)	Delaware
St. Louis University School of Medicine	(1912), (1918)	Missouri
University of Michigan Medical School	(1918, 2), (1919)	Michigan
Washington University	(1921, 2)	Missouri
Creighton University	(1921, 2)	Nebraska
University of Nebraska	(1921, 2)	Nebraska
University of Cincinnati	(1921)	Ohio
University of Oklahoma	(1921)	Oklahoma
University of Vermont	(1906)	Maine

* These candidates have finished the medical course, and will receive the M.D. degree after they have completed a year's internship in a hospital.

† This candidate has finished the medical course and received the M.D. degree, and will obtain the M.D. degree after he has completed a year's internship in a hospital.

Maine July Examination

Dr. Adam P. Leighton, acting secretary, Maine State Board of Registration in Medicine, reports the written examination held at Augusta, July 5-6, 1922. The examination covered ten subjects and included 100 questions. An average of 75 per cent. was required to pass. Fifteen candidates were examined, all of whom passed. Four candidates were licensed by reciprocity. The following colleges were represented:

College — PASSED	Year Grad.	Per Cent.
Yale University	(1922)	81, 84, 85, 86, 86
Johns Hopkins University	(1917)	90
Boston University	(1921)	83, 88, 89
Tufts College Medical School	(1922)	80, 80, 84, 86
College of Phys. and Surgs. in the City of New York	(1895)	80
University of Montreal	(1919)	83

College — LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Maryland Medical College	(1912)	W. Virginia
Dartmouth Medical School	(1895)	New Hamp.
Columbia University	(1909)	New Hamp.
Chattanooga Medical College	(1904)	Alabama

Book Notices

RADIUM THERAPY. By Frank Edward Simpson, A.B., M.D., Professor of Dermatology, Chicago Policlinic. Cloth. Price, $7. Pp. 391, with 166 illustrations. St. Louis: C. V. Mosby Company, 1922.

A textbook on radium therapy by one whose clinical experience with its use has been so extensive as that of Dr. Simpson could be expected to furnish a useful and reliable addition to the literature of this field, and perusal of the book bears out this belief. The book, although not large, offers a comprehensive review of the modern science of radiology, including, as it does, a consideration of every phase of the subject, from the origin and chemical nature of radium to its therapeutic application. The bibliography, which contains fifty-nine pages, attests the full investigation which underlies the work. The first ten chapters, comprising eighty-six pages, are concerned with the technical and theoretical phases of the subject, covering radioactive substances in general; the origin and chemical nature of radium, radium emanation and radioactive deposit, with the technic of preparation of the former for its therapeutic use; absorption and filtration of rays; physical and chemical effects of radium rays, and their biologic effects. Included here is a rather long and largely technical chapter covering the author's experimental work on the absorption of gamma rays. On the whole, however, in view of the highly specialized nature of the subject, this portion of the book is written in such a style that the greater part of it can be easily understood by the physician who has no special knowledge of the physics of radium. The next four chapters, dealing with radium reactions, therapeutic apparatus, dosage and the technic of irradiation present the general considerations of radium therapy in adequate fashion, although the formulas used in determining dosages are so complicated that the average reader will find himself beyond his depth. Following this is a discussion of the use of radium or its emanations in the special fields of medicine, with a full statement of the form of the agent best suited for the special condition; type and thickness of screens to be employed, and mode and time of application for each disease in which its use is advised. In the chapters dealing with its employment in general surgery and gynecology, the author displays a conservative and open-minded attitude which is likewise evidenced in the chapters on radium in dermatology, diseases of the eye, ear, nose and throat, diseases of the ductless glands, and internal medicine. The instructions for its employment in the various conditions are so clearly and simply stated, and warnings against overdosage so emphasized, that the casual user of radium finds this an excellent guide for his efforts. The closing chapter deals with the professional injuries due to radium. The book is liberally illustrated with engravings, which include various charts, depiction of apparatus and a number of clinical photographs showing the condition before and after treatment. Most of the latter illustrate gratifying results, but others are included, which, like the text, do not hesitate to record the limitations of the agent employed. Simpson's textbook can be highly recommended as an able and modern exposition of the subject of radiology, of value to physicians generally as well as to those actively occupied with radium therapy.

A HISTORY OF THE NATIONAL TUBERCULOSIS ASSOCIATION. The Anti-Tuberculosis Movement in the United States. By S. Adolphus Knopf, M.D. Cloth. Price, $4.50. Pp. 505. New York: National Tuberculosis Association, 1922.

This book is divided into three parts: The first part—149 pages—is devoted to a history of the development of the knowledge of tuberculosis in this country, to the early efforts to secure general recognition of the fact that tuberculosis is communicable, and to the organization of the National Tuberculosis Association. A special chapter describes the Framingham demonstration; in a rather long chapter is a brief account of each of the state tuberculosis associations. There is also a special chapter by Dr. Philip P. Jacobs on the Sixth International Congress. The second part—104

pages—contains brief acounts of the annual sessions of the association since its organization. The third part—190 pages—consists of biographies, portraits, and bibliographies of the officers of the association, and of noted men interested in the work, such as Grover Cleveland, Sir William Osler, Major-General Gorgas and President Harding. Each of the biographies is accompanied with a portrait, and most of them with partial bibliographies. There are three appendixes: The first—nine pages—makes a brief reference to the work done by the Army, Navy and Public Health Service during the World War; the second—three pages—gives a list of publications of the National Tuberculosis Association, and the third—thirteen pages—is a list of some 260 contributions to the literature, by the author, Dr. S. Adolphus Knopf. This is an excellently gotten-up, well-printed and attractive book of a little more than 500 pages. It is, however, a book that will have little general appeal; its primary interest will be to those who are personally concerned in the work of the organization it describes.

MEDICAL OPHTHALMOLOGY. By R. Foster Moore, O.B.E., M.A., B.Ch., Assistant Ophthalmic Surgeon, St. Bartholomew's Hospital. Cloth. Price, $3.50. Pp. 300, with 80 illustrations. Philadelphia: P. Blakiston's Son & Co., 1922.

For the man in general practice who is desirous of knowledge of the eye complications of the diseases that come within his sphere, this book is to be most highly recommended, at least in part. The first portion of the book deals with diseases of the general nervous system, more from the standpoint of the ophthalmologist than from that of the neurologist or the internist. It is an excellent review of our ophthalmologic knowledge of the visual tracts, based to a great extent on the war work of Gordon Holmes and Lister. The subsequent chapters are written more for the general practitioner, and are well done. No undue emphasis is laid on the refinements of ophthalmic diagnosis, but the attention is called rather to the possibilities of ocular disease that may occur consequent to systemic derangement. In a few details, the ophthalmic reader may not agree with Mr. Moore; but those details are not of sufficient import to impair even slightly the general value. The bibliography is far from complete; but in a book of this character that is designed as a bridge between the paths of the ophthalmologist and the internist, there is no great need for extensive references. The mechanical work of the book is excellent, and the illustrations, to a great extent diagrammatic, are well reproduced. True it is that this book is not the English equivalent of Heine's work; but, without doubt, Mr. Moore has given us the best modern book on this subject that we have in English.

TYPHOID CARRIERS AND TYPHOID IMMUNITY. Omnis Typhus ex Typho. By Abraham L. Garbat, M.D. Monographs of the Rockefeller Institute for Medical Research, No. 16. Paper. Price, $1.25. Pp. 110. New York: The Rockefeller Institute for Medical Research, 1922.

This interesting monograph is based on an elaborate and properly prolonged study of 164 cases of typhoid developing during the war in an internment camp in North Carolina. Among the many important observations is the fact that in as many as 15 per cent. of typhoid convalescents, typhoid bacilli may be discovered in the bile after three consecutive stool cultures have proved negative. The author considers that two consecutive negative bile cultures and two consecutive negative feces cultures are necessary to give an absolutely safe indication of complete absence of typhoid bacilli in the intestinal tract. Many interesting laboratory details are contained in the paper. The author found Endo medium very satisfactory for isolating the typhoid bacillus. It is to be regretted that some recent writers on typhoid, among whom the present author is one, are inclined to exaggerate the importance of typhoid at the present time in order to enhance the importance of their thesis. A curious oversight appears on page 4, in a statement regarding case mortality in typhoid based on city statistics enumerating reported cases and deaths. If the author had pushed his inquiries farther he would have found that in some communities more deaths are reported than cases.

Miscellany

THE LEGAL STATUS OF THE HOMOSEXUAL

Shall a man be punished for having red hair? If not, why punish him for being homosexual? Leonard Williams points out that homosexuality may depend on conditions for which the victim is not responsible and the results of which he cannot prevent or even modify, and says:

"I am entirely of the opinion, suggested rather than expressed in a recent lecture by my friend, Julian Huxley—namely, that the present law on the subject requires revision. Regarded in the light of pure physiology, it is no more reasonable to punish a man for being homosexual than it would be to punish him for having red hair. Both of these things are burdens cast upon him by forces over which he has no sort of control, nor can he alter or even modify them by any effort of the will. It is high time that the members of our profession expressed strong and clear views on this question. Let us remember that it is not so very long ago that people were tortured for being insane, and that it was a great-hearted French physician, Philippe Pinel, who died in 1826, who, at the risk of his own life and liberty insisted upon humane reforms which were afterward generally adopted."—*Brit. M. J.* **1**:833 (May 27) 1922.

Williams' suggestion, however, simply raises questions as to how far a person should be required to control a supposedly overpowering instinct, and how far the prospect of punishment in event of default will serve as a stimulus to self-control; and these questions are unanswerable except as they may be answered in a practical way, in the light of experience. The forces of impulsion and self-control cannot be measured and weighed, the one against the other; they vary to almost unlimited degrees in different persons, and vary widely even in the same person, with age, experience, observation and bodily and mental vigor. The best that we can do is to express the experience and judgment of mankind in customs and laws, having in mind, always, the welfare of the race. Undoubtedly, until our vision becomes infinite, injustice will occasionally be done and the innocent will suffer; but this is the penalty to which we are all exposed by reason of our human frailty.

For that class of offenders against our standards of morality and law who may be utterly unable to control its conduct, the situation as outlined by Williams has opened interesting possibilities. From a social standpoint it is impossible to consider such cases "in the light of pure physiology alone" (and this is all Williams professes to have done), but they must be considered in the light of social conditions also. Certainly present practice is unsatisfactory, which views all homosexual acts simply from the standpoint of criminal law; for it does no good to the offender, and but little good to society, to undertake to dispose of a homosexual offense by the exaction of a fine or by imprisonment for a longer or a shorter time. Such a proceeding simply does not dispose of the case at all. On regaining his freedom, the offender sooner or later repeats his offense, is again punished, and again set free to offend again—and so the matter goes on. If society is to be protected, and if youth is to be guarded against the blandishments and the seduction of incurable and irresponsible homosexual persons, there would seem to be but one course open—incarceration and institutional care.

The parallel drawn by Williams between homosexuality and insanity seems well drawn. The difficulty in one case, as in the other, lies in the determination in each instance as to whether the failure of the individual to conform to the standards set by society is due to his inability to conform rather than to his unwillingness to do so. In the one case, as in the other, if it is determined that asocial or antisocial conduct is due to the absence of the power of intelligent self-control, then unless some sort of guardianship outside the walls of an institution may be found sufficient for the protection of society, the unfortunate victim must be incarcerated, not as a punishment but simply for the protection of the community and the preservation of our social standards.

Medicolegal

Mother Not Liable for Services for Adult Daughter—Compensation of Expert Witnesses

(McClenahan v. Keyes (Calif.), 206 Pac. R. 454)

The Supreme Court of California, which reverses a judgment obtained by the plaintiff, says that he sued the executor of the will of a Mrs. Howard, on a claim for $1,821 for services rendered as a physician to a daughter of the decedent who was thought to be insane. The plaintiff, whose incompetency to testify to a conversation with the decedent was waived by the taking of his deposition by the defendant, testified that the mother had had him explain the condition of her daughter, what had been done and what was necessary to be done, and assured him in words and manner that she wished him to go ahead and render all of the necessary services—that he would be adequately compensated. But the court does not think that the evidence was sufficient to support the findings in favor of the plaintiff. The daughter was a wealthy woman, able to pay for the services rendered her, and, notwithstanding the alleged contract of employment by the mother, the plaintiff continued to make the charges on his books against the daughter, and subsequently sued the latter for the full amount of the claim, but was defeated therein largely by the daughter's contention that his services were hostile to her rather than for her benefit.

The mother was not liable for the services in the absence of a contract on her part to pay for them. The general rule is that one who calls a physician to render services to another is not liable for those services in the absence of an express agreement to pay therefor. This rule applies when the physician is called by a parent to render services to an adult son or daughter, and to services rendered to a daughter-in-law or to a wife's relative. Here, too, it should be borne in mind that the plaintiff advised the mother that the daughter was incompetent and should be placed under guardianship; wherefore, the amount of compensation to be allowed to the plaintiff would be passed on by the mother or such other relative as was appointed guardian; and it was therefore important that he should know that the relatives of the patient, including the mother, desired him to render services, and were willing that he should be compensated for them. If it had been the intention either of the plaintiff or of the mother that she should become personally responsible for the payment for such services, it would have been very simple for him to secure from her a direct statement to that effect. Moreover, if the services were performed on the credit of the daughter or if she was in any degree liable for the indebtedness, the mother would be a mere guarantor, and the contract of guaranty, not being in writing, would be void under the statute of frauds. The fact that the plaintiff was unsuccessful in establishing his claim against the daughter could not change the situation. In order that the promise of the mother to answer for the antecedent obligation of the daughter should be considered an original obligation, not required to be in writing, the statute required that the promise be made on a consideration beneficial to the promisor; and none was shown.

The plaintiff's claim against the mother included $789.50 for his services as an expert witness in the insanity and guardianship cases. The authorities are not in accord as to the circumstances under which an expert who is called as a witness may receive compensation. Some courts even hold that a contract to pay extra compensation is void. The authorities, however, all agree that, in the absence of an express contract to pay a physician for his testimony as an expert, he is entitled only to the statutory fee. The uniform rule seems to be that a physician who has acquired knowledge of a patient or of specific facts in connection with the patient may be called on to testify to those facts without compensation other than the ordinary witness receives for attendance on court. In those states recognizing the right to extra compensation for a physician who testifies as an expert, it is uniformly held that, when such testimony is sought to be elicited without requiring any particular investigation on the part of the physician, he is required to testify without extra compensation. The court does not need to determine the exact limits of the rule in California, for the reason that there was absolutely no showing of any agreement to pay the physician as an expert witness, as distinguished from his services as a physician in the case. There was no implied contract for the payment of extra compensation due to the fact that he was used as a witness. The law fixes the fees of a witness, and the only obligation incurred in the summoning of a witness is the obligation to pay the fees which the law fixes for the attendance of a witness.

Liability of Health Officers for Inhuman Treatment in Quarantining Patients

(Moody v. Wickersham (Kan.), 207 Pac. R. 847)

The Supreme Court of Kansas, in affirming a judgment in favor of the plaintiff for $1,212.50, or $25 for pain and suffering, $25 for loss of time, and $1,162.50 for punitive damages, holds that actual damages were shown, and punitive damages were properly awarded; that health officers, in quarantining patients in time of smallpox or other epidemics, must act in a reasonably humane and considerate manner. The court says that the plaintiff, who was a housekeeper for a hotel and had been earning $50 a month, became sick and called a physician, who pronounced the case one of smallpox and notified the defendant, who was the secretary of the board of health and acting health officer. Her story, in brief, was that the defendant came to the hotel and, without giving her any reason, gave her fifteen minutes in which to get ready, and took her away in an open car on a very cold day. In passing through the cemetery he said: "You had better pick you a headstone, 'cause here's where I am going to take you next." He left her at a small shanty that was in charge of a very unkempt man. She protested at being left there. The condition of the house was dirty and nasty. The defendant told her that she could clean it up if she wanted to, but she had nothing to clean with. There was a box for a table, off which they ate dinner, a little coal stove to cook on, and two beds which stood end to end, in the one-room house. The house was boarded up and down, but the boards did not fit together, and there were cracks. Quilts were put up around the bed to keep the wind out. There were no conveniences to answer the calls of nature. The man went out. He also carried out the slop-jar. At night a nurse came, who sent out for material and made a curtain, and took care of the plaintiff until she was removed by the defendant, after three days, in the same car in which she was taken to the shanty, so that she got very cold again, in the chilly wind that prevailed. The people with whom she was left said that they could not keep her, but the defendant went away and left her there, where she suffered from cold all the rest of the evening, and the people took care of her, while for much of the time for several days she was in a sinking condition.

The defendant's version of the affair was that he told the plaintiff she would have to be isolated; that the place was crude, and not sanitary, but he knew of no other place to segregate people having contagious diseases; that he told her he would remove her to a better place as soon as one could be obtained; that he had jocularly remarked, "Well, now, here is the cemetery right handy if anything happens," and she laughed.

The jury by their answers to special questions said that the defendant did not act in good faith; that he was not considerate toward the plaintiff at all times in removing her from the hotel to the pesthouse and from there to the home mentioned; that she suffered unusual inconvenience, and that the defendant was negligent toward her; that the negligence consisted of improper conveniences and being confined with a man alone for twelve hours in an insanitary pesthouse.

A health officer, while required to obey his lawful orders and perform his official duty, is never excused from wanton conduct and inhuman treatment of patients suffering from serious illness. It was argued that, as the defendant was a quasi-judicial officer, he was not responsible in damages for

his acts, and it was pointed out that it is the duty of health officers to segregate from the public and to quarantine all persons sick with smallpox, and it was said that in moving the plaintiff from the hotel he was exercising quasi-judicial powers and performing a governmental function. A physician had already pronounced the case smallpox, and it took no exercise of judicial power on the part of the health officer to move the patient to a place where the guests and occupants of the hotel would be free from danger of infection. Of course, in removing her he was acting in a governmental capacity, but persons who act in that capacity are required to treat other human beings in a reasonably humane and considerate manner. The law no less than humanity requires humane and decent treatment of those who must be segregated from their usual conveniences and friends, and whoever acts with utter disregard of this requirement renders himself liable. The contention that the evidence in this case was insufficient to establish a cause of action needs no discussion. The evidence warranted the finding that the defendant acted carelessly, wantonly or maliciously.

Legal Definition of Insane Delusion

(Wigginton's Executor et al. v. Wigginton et al. (Ky.), 239 S. W. R. 455)

The Court of Appeals of Kentucky, in reversing a judgment rendered against the validity of a contested will, says that insane delusions are spontaneous, and are not controlled by circumstances or the presence of others, or limited in their manifestations to a narrow period of time and never again discoverable. An insane delusion affecting the power of testamentary capacity, as uniformly construed, is the spontaneous production of a diseased mind, leading to a belief in the existence of something which either does not exist or does not exist in the manner believed. Prejudice, resentment, anger and moral delinquency may all exist without reason therefor; but if the delusional phase is not the spontaneous production of a diseased mind, based on no evidence whatever, it will not be classed as an insane delusion.

Attendance of Patient at Office Under Narcotic Law

(Hurwitz v. United States (U. S.), 280 Fed. R. 109)

The United States Circuit Court of Appeals, Eighth Circuit, in reversing a judgment of conviction of defendant Hurwitz and granting him a new trial, says that, to the charge against him of selling about an ounce of morphin, to a named person, without having registered as a dealer in such derivatives of opium, his defense was that what he did he had a right to do as a practicing physician. The evidence showed that he was a practicing physician and duly licensed to dispense opium, etc., by the United States revenue collector for the district in which he resided, and that what he did was done at his office. Section 2a of the Harrison Narcotic Law provides that nothing contained in this section shall apply to the dispensing or distribution of any of the enumerated drugs to a patient by a physician registered under this act in the course of his professional practice only; provided he shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date and the name and address of the patient to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed to a patient whom such physician shall personally attend. Under the authority conferred by Section 1 of the act, as amended in 1919, the commissioner of internal revenue promulgated the following rule:

Dispensing by Practitioners.—Practitioners are permitted to dispense narcotic drugs to bona fide patients, pursuant to the legitimate practice of their professions, without prescriptions or order forms. However, a record of drugs so dispensed must be kept, except when the practitioner is in personal attendance upon the patient. A practitioner is not regarded as in personal attendance upon a patient, within the intent of the statute, unless he is in personal attendance upon such patient away from his office.

The trial court, in its charge to the jury in this case, said: "A physician is not in personal attendance unless he is in personal attendance upon such patient away from his office." Presumably, the court took the language used from the rule mentioned above. Exception was taken to this language of the court by the defendant; and the circuit court of appeals is of the opinion that error was committed by the trial court in making such a statement. The power of the commissioner of internal revenue, with the approval of the Secretary of the Treasury, to make all needful rules and regulations for carrying the provisions of the narcotic act into effect, did not confer the power to say that a physician could not personally attend a patient in his office. The enforcement of the act did not require any such rule, and it is contrary to the language of the act itself, which is plain and unambiguous, and says nothing about where the patient shall be when personally attended. If Congress had intended to exclude personal attendance at office, it would have said so. The fact of omission is strong evidence that it did not intend to say so. Congress cannot delegate legislative power to an executive officer.

Testimony as to Venereal Disease in Rape Case

(Riley v. State (Ga.), 111 S. E. R. 729)

The Supreme Court of Georgia, in affirming a judgment of conviction of defendant Riley, says that, on the issue as to whether he had had sexual intercourse with the female child alleged, a physician testified to the effect that, at a stated time, about seven months prior to the alleged criminal act, he had treated the accused for a particular venereal disease. That testimony was relevant in connection with other evidence tending to showing that the child developed that disease within about seven days after the alleged criminal act; that the alleged disease was usually communicated from one person to another by sexual intercourse, and that, when communicated, it usually manifested itself with a period of from three to ten days after the act. The fact that another physician testified that, shortly after the offense was alleged to have been committed, he made several examinations of the accused, and that, in his opinion, the latter was not infected with the disease, would not render the testimony of the first physician inadmissible. It would make a conflict of evidence, going to the credibility of the witnesses or the evidential value of their respective opinions, but would not go to the admissibility of the evidence of either.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, Oct. 18-20. Dr. Louis J. Mitchell, 29 E. Madison St., Chicago, Secretary.

American Child Hygiene Association, Washington, D. C., Oct. 12-14. Miss G. B. Knipp, 111 Cathedral St., Baltimore, Md., Secretary.

American Public Health Association, Cleveland, Ohio, Oct. 16-19. Mr. A. W. Hedrich, 370 Seventh Ave., New York, Secretary.

Association of Military Surgeons of the United States, Washington, D. C., Oct. 12-14. Col. James Robb Church, M. C., U. S. Army, Medical Museum and Library, Washington, D. C., Secretary.

Central States Pediatric Society, Cincinnati, Oct. 16-17. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Colorado State Medical Society, Colorado Springs, Oct. 3-5. Dr. F. B. Stephenson, Metropolitan Bldg., Denver, Secretary.

Delaware State Medical Society, Dover, Oct. 9-10. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Hawaii, Medical Society of, Honolulu, Nov. 19-21. Dr. F. J. Pinkerton, 15-46 Young Building, Honolulu, Secretary.

Kentucky State Medical Association, Paducah, Oct. 16-19. Dr. J. A. McCormack, 532 W. Main St., Louisville, Secretary.

Medical Association of the Southwest, Hot Springs, Ark., Oct. 16-18. Dr. W. H. Bailey, 115 West 21st Street, Oklahoma City, Okla., Sec'y.

Minnesota State Medical Association, Minneapolis, Oct. 12-13. Dr. Carl B. Drake, Central Bank Building, St. Paul, Secretary.

Mississippi Valley Medical Association, Rochester, Minn., Oct. 10-12, Dr. Henry Enos Tuley, 244 Francis Bldg., Louisville, Ky., Secretary.

Nevada State Medical Association, Reno, Oct. 6-7. Dr. Horace J. Brown, Goldfield, Secretary.

Pennsylvania, Medical Society of the State of, Scranton, Oct. 2-5. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Southern Medical Association, Chattanooga, Tennessee, Nov. 13-16. Mr. C. P. Loranz, Empire Building, Birmingham, Alabama, Secretary.

Tri-State District Medical Society, Peoria, Ill., Oct. 30-Nov. 2. Dr. William B. Peck, Freeport, Ill., Managing Director.

Vermont State Medical Society, Burlington, Oct. 12-13. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Virginia, Medical Society of, Norfolk, Oct. 31-Nov. 3. Mr. G. H. Winfrey, 104½ W. Grace Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

August, 1922, **164**, No. 2

Action of Digitalis in Case of Auricular Fibrillation and Flutter. T. Lewis, London, Eng.—p. 157.
*Spleen and Digestion. Study III. Spleen in Inanition; Effect of Removal of External Secretion of Pancreas on Spleen. W. DeP. Inlow, Rochester, Minn.—p. 173.
Gastrospasm: Clinical and Roentgenologic Study. I. W. Held, New York, and J. Roemer, Paterson, N. J.—p. 188.
*Best Technic for Gastro-Enterostomy as Determined by Functional Results. A. O. Wilensky, New York.—p. 209.
Male Sexual Gland in Prevention of Creatinuria. M. D. McNeal, Rochester, Minn.—p. 222.
Clinical and Pathologic Study of Neuritis in Tropics, with Special Reference to Beriberi. W. E. Musgrave, San Francisco, and B. C. Crowell, Rio de Janeiro.—p. 227.
Clinical Differentiation of Epidemic Encephalitis, Acute Poliomyelitis, Botulism and Certain Forms of Food and Drug Poisoning. G. E. Ebright, San Francisco.—p. 253.
Status of Exercise in Tuberculous Considered from Neuromuscular Viewpoint. F. P. Miller, Los Angeles.—p. 263.
Postoperative Massive Collapse of Lungs. F. J. Hirschboeck, Duluth, Minn.—p. 268.
*Bacterial Endocarditis as Sequel to Syphilitic Valve Defect. L. H. Briggs, San Francisco.—p. 275.

Spleen in Inanition.—The data submitted by Inlow justify the conclusion, he says, that the spleen loses markedly in weight in inanition and are in general corroborative of the findings of other investigators. The loss in the weight of the spleen is out of all proportion to the decrease in body weight, being almost three times as great as a maximum in extreme cases of acute inanition, and approximately twice as great in cases, less acute. The removal of the external function of the pancreas by ligation of the pancreatic ducts or resection of the duodenal portion of the gland likewise leads to an excessive decrease in the size of the spleen. This finding confirms the observations of Sweet and Ellis. However, the shrinkage of the spleen under these conditions can be explained as due to the inanition resulting from the exclusion of the pancreatic juice from the intestine, and does not require for its elucidation the postulation of a specific pancreatic splenic interrelationship.

Best Gastro-Enterostomy Technic.—Evidence is presented by Wilensky which seems to show that the functional result of a gastro-enterostomy made with the aid of a Murphy button is superior to that of a gastro-enterostomy made by the suture method.

Bacterial Endocarditis Sequel of Syphilitic Endocarditis.—From a study of the literature, Briggs says, it would seem that the sequence of bacterial endocarditis on a syphilitic endocarditis is a decided rarity, despite the frequency of the latter condition and the fact that the former infection often has a selective action on the aortic valve. No reason can be assigned for this, although the age incidence of the two diseases probably plays some part. Another factor may be the increased vascularity of the valve previously damaged by rheumatic fever as compared with that damaged by syphilis. A case is reported of an individual suffering from a typical syphilitic aortitis and aortic endocarditis. One year later the patient enters the hospital with a nonhemolytic streptococcic endocarditis, which pursues the usual course and terminates in death. At necropsy a characteristic syphilitic aoritis with involvement of the aortic ring is found, together with an acute verrucose endocarditis of all the aortic cusps and perforation of one, with an extension into one mitral leaflet.

American Journal of Obstetrics and Gynecology, St. Louis

August, 1922, **4**, No. 2

Morphometry of Human Fetus with Special Reference to Obstetric Measurements of Head. L. A. Calkins, Minneapolis.—p. 109.
*Brief Review of Physiologic and Embryologic Genesis of Pseudohermaphroditism, with Report of Case. M. A. Goldberger, New York.—p. 130.
*Preoperative Digitalization. Method to Reduce Postoperative Complications. S. H. Geist and J. S. Somberg, New York.—p. 135.
Reflex Gastric Symptoms in Diseases of Female Pelvic Organs. A. F. R. Andresen, Brooklyn.—p. 142.
Ectopic Pregnancy. Analysis of 186 Cases. P. Graffagnino, New Orleans.—p. 148.
Tubal Patency Test and Unsealing by Simple Air Filled Pipet. R. L. Dickinson, New York.—p. 159.
Some Moot Points in Diagnosis of Causes and in Treatment of Sterility. B. C. Hirst, Philadelphia.—p. 160.
Unsuspected Male Sterility. W. H. Mackinney, Philadelphia.—p. 165.
Review of Seventy-Five Consecutive Hysterectomies for Fibromyoma Uteri. R. C. Van Etten, New York.—p. 169.
Treatment of Syphilis in Pregnancy in Department of Health in Detroit. W. E. Welz and A. E. Van Nest, Detroit.—p. 174.
*Prevention of Striae Gravidarum, Diastasis of Recti Muscles, Visceroptosis and Ptosis of Breasts in Pregnancy. G. C. H. McPheeters, Fresno, Calif.—p. 178.
Method of Disposing of Spill in Cesarean Section. E. L. Cornell, Chicago.—p. 183.

Case of Pseudohermaphroditism.—Goldberger classifies his case as one of pseudohermaphroditismus feminus, as the external female organs were present and normal except for an overdevelopment of the clitoris. Internally there was a gonad in the right labium majus presumably a rudimentary testis, possibly to be classified as similar to a free martin gonad of cattle. The uterus, tubes and ovaries were apparently absent. An important fact in the history was that two aunts on the father's side are known never to have menstruated or borne children and they had no mammary development whatever.

Importance of Preoperative Digitalization.—Assuming that any measure which will help to maintain the pressure, and especially the pulse pressure, would also be of value in reducing the incidence of the complications dependent on vascular disturbances, Geist and Somberg decided that digitalis, or any of its derivatives, being powerful cardiac stimulants, would be of value, and a series of operative cases was investigated to determine the value. The patients were subjected to practically all of the more severe gynecologic and general surgical procedures. There were practically no complications. The postoperative course was excellent and there were no pronounced ill effects from the digitalis. The blood pressure drops were minimal, the pulse pressure being maintained throughout. Of a group of thirty-nine undigitalized cases, postoperatively, 30 per cent. of these had a poor pulse; two patients developed such a poor, weak, irregular pulse that hypodermic stimulation with a digitalis preparation had to be used. Fifteen per cent. showed poor color, either pallor or cyanosis. Fifty-seven per cent. vomited several times; 43 per cent. did not vomit or had only nausea. The alertness seen in the digitalized cases was lacking, instead the usual postanesthetic mental aberration was the rule. The rapid recovery seen in the digitalized cases was also missing in the greater portion, and the asthenic condition of some of the patients was quite striking, when compared to the digitalized cases, who had had similar operative procedures. There were six cases of pneumonia, two cases of shock, two cases of bronchitis and one case of phlebitis. The total percentage of complications is 27 per cent. in these undigitalized cases, compared to the zero percentage of complications seen in the digitalized groups. This Geist and Somberg regard as being by far the most important and likewise the outstanding feature of this series of experiments.

Prevention of Striae Gravidarum and Visceroptosis.—McPheeters claims that persistent, systematic daily massage with both hands, after a method developed by him, will positively prevent the formation of striae gravidarum. He also advocates wearing a suitable maternity corset, or, maternity abdominal supporter, fitted by a competent corsetierre under the attending physician's supervision, for the purpose of supporting the lower half of the abdomen. It is asserted that this gives complete relief from backache, the discomfort of distention, groin pains, persistent frequency of urination and fatigue on slight exertion. Nearly all patients are thereby enabled to be active on their feet and continue needed physical exercise until actual lightening. Diastasis of recti muscles with the accompanying enlargement of the umbilical space is prevented thereby and fewer patients are left with visceroptosis.

American Journal of Ophthalmology, Chicago

August, 1922, **5**, No. 8

Hernia Through Tenon's Capsule with Extrusion of Orbital Fat a Birth Injury. W. S. Franklin and W. D. Horner, San Francisco.—p. 601.
Lymphosarcoma of Orbit Probably Arising in Choroid. I. Hartshorne, New York.—p. 604.
Exophthalmos in Exophthalmic Goiter: Study of 400 Cases. I. Bram, Philadelphia.—p. 609.
Agricultural Conjunctivitis. J. M. Patton and S. R. Gifford, Omaha.—p. 623.
Bilateral Blood Staining of Cornea. H. S. Gradle, Chicago.—p. 638.
Third Nerve Reflexes. J. P. Williams, Lincoln, Neb.—p. 642.
Glaucomatous Cupping with Low Ocular Tension After Wood Alcohol Poisoning. F. A. Morrison, Indianapolis.—p. 645.
Anomalous Movement of Blind Eye on Closing Other. A. W. Stirling, Atlanta, Ga.—p. 645.
Unusual Type of Vitreous Opacity. L. W. Deichler, Philadelphia.—p. 646.
Total Coloboma of Iris. L. W. Morsman, Hibbing, Minn.—p. 647.

American Journal of Physiology, Baltimore

August, 1922, **61**, No. 3

*Voluntary Acceleration of Heart. N. B. Taylor and H. G. Cameron, Toronto.—p. 385.
Relation of Blood Volume to Tissue Nutrition. I. Effects of Hemorrhage on Circulatory and Respiratory Response to Changes in Percentage of Oxygen and Carbon Dioxid in Respired Air. R. Gesell, E. Blair and R. T. Trotter, Berkeley, Calif.—p. 399.
Id. II. Effects of Graded Hemorrhage on Volume Flow of Blood Through Striated Muscle of Dog. R. Gesell and C. A. Moyle, Berkeley, Calif.—p. 412.
Id. III. Effects of Hemorrhage and Subsequent Intravenous Injection of Gum Saline Solution on Response of Striated Muscle to Rapid Stimulation with Supplementary Data on Effects of Hemorrhage and Infusion on Salivary Secretion Elicited by Intravenous Injection of Pilocarpin. R. Gesell and C. A. Moyle, Berkeley, Calif.—p. 420.
Statistical Study of Pulse Rate and Arterial Blood Pressures in Recumbency, Standing and After a Standard Exercise. E. C. Schneider and D. Truesdell, Long Island, N. Y.—p. 429.
Studies in Fatigue. XI. Effect of Intravenous Injection of Massive Doses of Epinephrin on Skeletal Muscle at Rest and Undergoing Fatigue. C. M. Gruber, St. Louis.—p. 475.
Further Studies on Hydrogen Ion Concentration of Human Sweat. G. A. Talbert, Chicago.—p. 493.
Estimation of Cardiac Volume in Living Animal by Means of Teleroentgenogram. J. H. Skavlem, Madison, Wis.—p. 501.
Studies of Cell Division. I. Effect of Dilute Sea Water on Fertilized Egg of Echinarachinius Parma During Cleavage Cycle. E. E. Just.—p. 505.
Fertilization Reaction in Echinarachnius Parma. V. Existence in Inseminated Egg of Period of Special Susceptibility to Hypotonic Sea Water. E. E. Just.—p. 516.
*Studies on Physiology of Capillaries. V. Reaction of Human Skin Capillaries to Drugs and Other Stimuli. E. B. Carrier, Copenhagen.—p. 528.
Responses of Fundulus to White, Black and Darkness. G. H. Parker and A. J. Lanchner.—p. 548.
Protoplasmic Effects of Papaverine, Histamin and Other Drugs, in Relation to Theory of Smooth Muscle Contraction. H. S. Hopkins, Baltimore.—p. 551.
Comparative Study of Different Methods of Artificial Respiration. R. Burton-Opitz, New York.—p. 562.
*Effect of High Protein Diet on Blood Catalase. W. E. Burge and J. M. Leichsenring, Champaign, Ill.—p. 574.

Voluntary Acceleration of Heart.—A case of voluntary heart acceleration is described by Taylor and Cameron and a brief account is given of the manner in which the accomplishment was acquired. Dilatation of the pupils, vasoconstriction and elevation of the blood pressure, are associated with the increased heart rate. Atropin administration depresses but does not abolish the power of voluntary acceleration. Decided glycosuria occurs as an after effect of a series of acceleratory efforts. The conclusion is drawn that the acceleration is due, in part, to the withdrawal of vagal tone and in part to excitation of the accelerators, the two influences being called into reciprocal action by the voluntary effort.

Physiology of Capillaries.—Using Lombard's method, the smallest vessels in the human skin have been examined microscopically by Carrier. By this method the rate of flow, the character of the stream and the state of contraction of the capillaries can be seen. Cold produces a contraction of arterioles with a slowing in the blood stream and contraction of the capillary wall. When the cold becomes extreme, the capillaries are paralyzed, open up and fill ultimately with venous blood. Stroking an area of skin with a blunt point opens all the underlying vessels. This initial flush is followed by the usual dermatographic reactions. Epinephrin, from 1:1,000 up to 1:10,000 produced contraction of both capillaries and arterioles. Histamin from 1:1,000 up to 1:10,000, at the end of the nail, produced dilatation of the capillaries with hastening of the blood stream. On the back of the hand the effect was complicated by edema. Pituitary extract up to 1:100 produced contraction of the capillaries. Acetylcholine, 1:5,000 and 1:10,000 dilated both capillaries and arterioles. Amyl nitrite, undiluted, dilated the capillaries slightly and increased the rapidity of the stream. When inhaled, all the capillaries were open with a very rapid flow. Urethane, 25 per cent., dilated both arterioles and capillaries. All the observations agree with the view that the diameter of the capillaries is not necessarily dependent on the pressure in the arterioles, but rather on their own tone and state of contraction. They normally contract or reflex independently of the pressure behind them, but in response to local or general stimuli.

Effect of High Protein Diet on Blood Catalase.—Burge and Leichsenring found that the ingestion of a large meal of meat produces an increase in catalase parallel with the increase produced in metabolism. The ingestion of large quantities of meat for several successive days increases catalase corresponding with the rise produced in basal metabolism.

American Journal of Public Health, New York

September, 1922, **12**, No. 9

Federal Aid for Protection of Maternity and Infancy. G. Abbott.—p. 737.
National Research Council. V. C. Vaughan, Washington, D. C.—p. 746.
Rapid, Simple Method of Making Charts. G. H. de Paula Souza, Sao Paulo, Brazil.—p. 757.

American Journal of Roentgenology, New York

August, 1922, **9**, No. 8

Graduate Instruction in Roentgenology. J. S. Shearer, Ithaca, N. Y.—p. 459.
Graduate Instruction in Roentgenology. G. W. Holmes, Boston.—p. 465.
Measurement of Roentgen Radiation by Means of Ionization Chamber and Galvanometer. W. Duane Cambridge, Mass.—p. 467.
*Roentgen-Ray Treatment of Chronically Infected Tonsils and Adenoids. C. A. Waters, P. B. MacCready and C. H. Hitchcock, Baltimore.—p. 469.
Radiation Therapy. G. Failla, E. H. Quinby and A. Dean, New York.—p. 479.
Effects of Roentgen Rays and Radioactive Substances on Living Cells and Tissues. L. Loeb, St. Louis.—p. 497.
Present Field for Use of Roentgen Rays and Radium in Treatment of Malignant Neoplasms. W. S. Stone, New York.—p. 502.
Ante-Operative Radiation of Carcinoma of Breast. R. H. Boggs, Pittsburgh.—p. 508.
Dosage and Technic in Roentgen-Ray Treatment of Goiter, Tuberculous Glands of Neck, Tonsils and Adenoids. W. D. Witherbee, New York.—p. 514.
*Caput Puddling. A. Bassler and J. R. Lutz, New York.—p. 517.
Case of Kohler's Disease. B. M. Bernstein, Brooklyn.—p. 518.

Roentgenotherapy of Infected Tonsils.—Eight cases treated with two courses of four radiations each are discussed by Waters et al. from the point of view of the bacterial flora of the tonsils and pharynx. Seven were found definitely to harbor the hemolytic streptococcus. Three are regarded as incompletely studied. In three other cases, the hemolytic streptococcus persisted at least four weeks following the termination of treatment. Of the remaining two, one presented an approximately normal flora throughout. The other may be regarded as improved from the bacteriologic point of view, but there is no proof that this improvement is persistent. There is no evidence that reduction in the size of hyperplastic tonsils by irradiation is accompanied by eradication of the carrier state in individuals harboring the hemolytic streptococcus in these tonsils.

Caput Puddling.—Bassler and Lutz draw attention to a form of stasis existent mainly in the caput coli, not because in the study of the cases an entity of importance can be attached to it, but because it does not always exist with so-called cecal stasis, may occur when the rest of the right colon drains practically well enough, and clinically it appears to be of more than casual roentgenologic interest in symptomatic ways, although the symptoms cannot be differentiated sharply from colonic stasis in a general way. This puddling occurs in the caput below the level of the ileocecal valve, and it is this limited residue collection with practically an

empty colon distal to the valve that is the distinctive feature of the roentgenologic diagnoses. In the study of the histories of a number of such cases there are no distinctive features leading to a definite diagnosis of caput puddling. Chronic colitis is more frequent and a history of chronic digestive disturbances occurs most often.

Annals of Otology, Rhinology and Laryngology, St. Louis

June, 1922, **31**, No. 2

Fatalities Following Operations Upon Nose and Throat Not Dependent on Anesthesia—Study of Three Hundred and Thirty-Two Hitherto Unreported Cases. H. W. Loeb, St. Louis.—p. 273.
Optic Nerve and Accessory Sinuses. J. van der Hoeve, Leiden, Holland. —p. 297.
Recent Observations on Laryngopulmonary Tuberculosis. J. Dworetzky, Liberty, N. Y.—p. 311.
Use of Ear Plugs in Aviation. L. E. Tefft and E. K. Stark, Mitchel Field, L. I., N. Y.—p. 329.
Larvae of Fly Sarcophaga (Sarcophila) Wohlfahrth in Ear. A. Zebrowski, New York.—p. 335.
Adenocarcinoma of Middle Turbinate, Antrum and Ethmoids Two Years After Radical Operation Without Recurrence. D. N. Husik, Philadelphia.—p. 345.
Chronic Stenosis of Larynx and Trachea with Report of Case Treated by Laryngostomy and Dilatation. E. C. Sewall, San Francisco.—p. 352.
Histopathology and Histogenesis of Benign Growths of Nose and Accessory Cavities. H. L. Baum, Denver.—p. 371.
Nasal Tuerculosis. W. B. Chamberlain, Cleveland.—p. 423.
Problem of Middle Ear Mechanics. Chapter II. A. G. Pohlman, St. Louis.—p. 430.
Misconceptions Regarding Import of Retraction of Drum Membrane. E. P. Fowler, New York.—p. 483.
Acute Infections into Sebaceous Glands and Hair Follicles of Nasal Vestibule. L. M. Hurd, New York.—p. 489.
Variations of Intracranial Symptoms from Frontal Sinusitis. L. Levy, Memphis, Tenn.—p. 493.
Acute Mastoiditis with Unusual Complications. E. P. Noreross, Chicago.—p. 501.
Rôle of Tonsils in Treatment of Nose Conditions, Infective and Obstructive—Study of 111 Cases. T. R. Gittins, Sioux City, Ia.—p. 507.
Suppurations of Labyrinth. E. Cobb, Marshalltown, Ia.—p. 523.
Application of Dental Molding Compound for Maintenance of Skin Grafts in Middle Ear and Mastoid Cavities. J. Israel, Houston, Tex. —p. 543.
Some Remarks on Indications for Simple Mastoid Operation in Adult. J. B. Rae, New York.—p. 546.
Specimens Illustrating Operative Aural Surgery and Making by Graduate Students of Preparations Showing Aural Surgical Anatomy. E. B. Gleason, Philadelphia.—p. 552.

Archives of Neurology and Psychiatry, Chicago

September, 1922, **8**, No. 3

*Visual Defects Caused by Occipital Lobe Lesions: Report of Thirteen Cases. H. W. Scarlett, Philadelphia, and S. D. Ingham, Los Angeles. —p. 225.
*Electromyographic Studies of Paralysis Agitans. S. Cobb, Boston.—p. 247.
Dermal Versus Epidermal Cholesteatomas Having Their Attachment in Cerebral Envelopes. G. Herrax, Boston.—p. 265.
*Epidemic (Lethargic) Encephalitis: Cultural and Experimental Studies. Second Communication. W. Thalhimer, Milwaukee.—p. 286.

Visual Defects Caused by Occipital Lobe Lesions.—The three patients forming the basis of the report made by Scarlett and Ingham had each received a wound of the head which involved one or both occipital lobes. In each of three cases a foreign body had traversed the brain for a considerable distance, in two instances passing from one hemisphere to the other across the median line. In two cases the roentgen ray revealed projectiles in the substance of the brain near the opposite side of the cranium from the points of entrance. In one case there was evidence that a projectile had been removed by early operation at a distance from the wound of entry. In several cases small fragments of bone were revealed within the cranial cavity near the defect in the skull. While none of the patients in this series came to necropsy and it was impossible to determine with accuracy the extent of the brain injuries, it was of some interest to observe the correlation of the visual defects and the brain lesions. The hypothesis is suggested by Scarlett and Ingham that a minute overlap of innervation exists along the entire vertical line separating the retinal halves. Each half of the macula is thus in relation with the corresponding occipital cortex, and the fixation point, situated on the line of division, possesses bilateral cortical connections.

Electromyographic Studies of Paralysis Agitans.—Eighteen cases of tremor were studied by Cobb. All of these showed features of the paralysis agitans syndrome, and in all the tremor was of the coarse type found in that condition, but only eleven of the cases were typical Parkinson's disease or the senile form of paralysis agitans. Cobb found that the tremor of paralysis agitans gives a characteristic electromyogram, with large, slow waves at the time of muscular contraction, and smaller, more frequent waves between these tremor contractions. The rate of the tremor of paralysis agitans is remarkably constant, the average being 5.8 per second. Little variation is observed in any one case when reexamined months later. In children the rate of the tremor may be much more rapid (9 per second in Case 12). Scopolamin may stop the tremor, but does not seem to slow the rate when acting less completely. Various muscles in the same person show practically the same rate of tremor.

Cause of Epidemic Encephalitis.—The investigations of epidemic encephalitis by Loewe and Strauss, which antedate other similar studies, seem to indicate that a filtrable, living agent, or virus, is regularly associated with this disease. This virus causes a disease in animals which is similar to, and in many animals identical with, epidemic encephalitis. The microscopic cerebral lesions in the animals are the same as those which have been found to be characteristic of this disease. From this virus, an extremely minute filtrable organism was grown in the ascites-tissue culture medium perfected by Noguchi. Cultures of this organism likewise produced the characteristic disease and lesions in animals. Thalhimer confirms the findings of Loewe and Strauss in their entirety.

Archives of Occupational Therapy, Baltimore

August, 1922, **1**, No. 4

Psychograph as an Instrument to Measure Working Capacity. J. Amar.—p. 255.
Occupational Therapy for Orthopedic Cases. N. Green. —p. 269.
Importance of Measurement of Movement in Orthopedic Cases. E. Bowman.—p. 279.
Results of Occupational Therapy with Regard to Health, Economics and General Welfare of Community. E. A. Griffin, Winnipeg, Man. —p. 281.
Organizing Occupation Therapy in New York County Hospitals. R. B. Harter, New York.—p. 291.

Archives of Surgery, Chicago

September, 1922, **5**, No. 2

*Intestinal Adenomas of Endometrial Type. Their Importance and Their Relation to Ovarian Hematomas of Endometrial Type (Perforating Hemorrhagic Cysts of Ovary). J. A. Sampson, Albany, N. Y.—p. 217.
*Autotransplantation of Endometrial Tissue in Rabbit. V. C. Jacobson, Albany, N. Y.—p. 281.
*Direct Transfusion of Blood. Report of Cases. J. S. Horsley, W. T. Vaughan and A. I. Dodson, Richmond, Va.—p. 301.
*Experimental Study of Methods for Bridging Nerve Defects: With Description of New Method of Autotransplant (Auto-Autotransplant). E. Sachs and J. Y. Malone, St. Louis.—p. 314.
*Preoperative Treatment of Malignant Tumors of Bladder by Radium. A. J. Scholl and W. F. Braasch Rochester Minn.—p. 334.
Leukoplakia of Kidney Pelvis. H. L. Kretschmer, Chicago.—p. 348.
*Primary Squamous Cell Carcinoma of Kidney as Sequel of Renal Calculi. H. G. Wells, Chicago.—p. 356.
Scoliosis Accompanying Chronic Infected Open Pneumothorax: Its Causation and Correction. F. B. Gurd, Montreal, Can.—p. 366.
Function of Gallbladder in Biliary Flow. C. Jacobson, Seattle, and C. Gydesen, Minneapolis.—p. 374.
Normally Developing Knee. I. Cohn, New Orleans.—p. 395.

Intestinal Adenomas of Endometrial Type.—Twelve cases are reported by Sampson and the pathology is discussed fully. He states that intestinal adenomas of endometrial type are implantation growths, similar in many ways to those arising from a rupture or perforation of a malignant (carcinomatous) ovarian cyst. The portions of the intestinal tract most frequently involved are those usually found in the pelvis; as the sigmoid, rectum, appendix and terminal loop of the ileum. In the twelve cases reported in this series, the rectum and the sigmoid, including the epiploic appendages, and the mesentery of the latter were involved in eight, the appendix in four and the small intestine in two. In the eight instances of implantations developing between adherent folds of peritoneum and other adherent structures (pocketed implantations) are best seen in the culdesac between the posterior wall of the uterus and the rectum, which are often fused together. The intestinal lesions are often only of his-

tologic interest and do not give rise to any symptoms. In other cases the lumen of the intestine is encroached on by indentations, by hypertrophy of its walls, and by hematomas; the latter may become larger during menstruation so that symptoms of obstruction may only occur or be more marked at that time. The operative treatment of intestinal adenoma of endometrial type is at present an unsettled problem. On finding what appears to be an intestinal lesion, Sampson examines carefully the surface of the intestine for dots and areas due to hemorrhage, to look for other implantations in the pelvis and most important of all to examine carefully the ovaries for any signs of a hematoma with evidence of a previous perforation, bearing in mind that it may be very small and is most frequently situated on the lateral or the under surface of the ovary. If the evidence found indicates an adenoma of endometrial type he does not disturb the intestinal lesion, except as it may be easily removed for histologic study, but deals with the pelvic organs as their condition requires.

Autotransplantation of Endometrial Tissue.—Experiments are reviewed by Jacobson as proof that endometrial tissue transplanted into the ovary and pelvic fat of the same animal will grow for as long as seventy days and probably much longer. Adenoma-like growths and multilocular cysts, which, histologically, show much similarity to "ovarian" cyst-adenomas of women, are produced. Under the influence of pregnancy, a more rapid epithelial growth occurs, with the production of a papillary "cyst-adenoma" which has some of the characteristics of a malignant growth. All of these observations are in agreement with Sampson's explanation of adenomas of endometrial type.

Direct Transfusion of Blood.—Horsley, Vaughan and Dodson emphasize the fact that in indirect transfusion, and particularly in citrate transfusion, there are chemical and biologic changes in the blood, and it seems probable that the reactions which often follow this method of transfusion are due to these changes. These reactions are sometimes very severe, and occasionally cause death. In the series of twenty-four cases of direct transfusion reported, which comprise all of the transfusions performed by the authors during the last eighteen months, there has been no reaction of any kind.

Bridging Nerve Defects.—In their experimental work Sachs and Malone tried a number of different methods of nerve repair, but all were discarded except three: (*a*) Anastomosis of the central and peripheral ends of an injured nerve into longitudinal incisions in a normal nerve. (*b*) Anastomosis of the central and peripheral ends of an injured nerve to flaps cut in the same quadrant of a normal nerve. (*c*) Autotransplant of half of the central end of the injured nerve, the segment removed being just long enough to bridge the defect (auto-autotransplant). It is shown that nerve fibers will grow down the trunk of a healthy nerve through a longitudinal incision without impairing its function and part of the fibers connect up with the peripheral end. It is, therefore, of distinct advantage to implant the central end of a cut nerve as well as the peripheral end. On account of the branching of regenerating fibers, enough axons are produced when a nerve is cut longitudinally to fill the sheaths in the implanted nerve, indicating that in a nerve anastomosis, an end-to-side implantation is perfectly satisfactory. This confirms clinical experience with anastomosis in facio-hypoglossal anastomosis. The study of cross-sections of nerves as well as the results following the method of auto-autotransplant described throw doubt on, in fact disprove, the content that peripheral nerves have an internal topography as maintained by Stoffel. The most important factor in a successful nerve anastomosis is the accurate approximation of the nerve ends so that there is no tissue between them which may interfere with the regeneration of the fibers. The method of auto-autotransplant described for bridging defects too long to permit of an end-to-end anastomosis is to be preferred to cable autotransplants because no normal nerve has to be injured and the operation can be carried on in one field. The method of choice for bridging large defects whenever possible is the double implantation method of anastomosis. Its advantage over the auto-autotransplant lies in the fact that some axis cylinders have only one suture line to grow through, while in the auto-autotransplant they all have to go through two suture lines.

Preoperative Radium Therapy of Bladder Tumors.—At the Mayo Clinic, the flat, infiltrating, rapidly recurring type of bladder tumor is exposed to radium before operation in an effort to reduce the activity of the malignant cells and prevent operative transplants and early postoperative recurrences. Tubes of radium emanation are inserted through the direct cystoscope into the substance of the tumor, which later is removed surgically. Specimens for histologic study are removed from the tumor before irradiation, and their histologic structure is later compared with that of the surgically removed area. In the majority of cases, there is a marked reduction in the size of the tumor, with a widespread and constricting fibrosis.

Squamous Cell Carcinoma of Kidney Pelvis.—The formation of keratinizing squamous cell carcinoma in the renal pelvis is a rare occurrence. In the case reported by Wells, which is of this sort, the metaplasia of the transitional epithelium to the squamous form was apparently the result of chronic irritation from renal concretions.

Boston Medical and Surgical Journal

Aug. 24, 1922, **187**, No. 8

*Roentgen-Ray and Tuberculosis in Infants and Children. F. W. O'Brien and F. B. Ames, Boston.—p. 279.
Interstitial Pregnancy, with Report of Case Operated Before Future. G. A. Moore, Brockton.—p. 284.
Unrecognized Fracture of Spine. M. G. Sturgis, Seattle, Wash.—p. 288.

Roentgenoscopy for Pulmonary Tuberculosis in Children.—Among seventy-eight infants and children, studied by O'Brien and Ames from the standpoint of correlating roentgen ray and clinical findings, there were twenty cases of definite chronic pulmonary tuberculosis in children under 14 years of age, or 24 plus per cent. Ten, or 50 per cent., of these cases were in children under 10 years of age. The authors believe that a large number of positive findings points to more widespread incidence of pulmonary tuberculosis in children than has yet been sufficiently emphasized. Eight patients were examined in whose lung fields the roentgenogram showed typical markings consistent with pathology caused by tubercle bacilli. These cases were negative clinically. The authors urge strongly that the making of serial roentgenograms should become a routine part of methods of procedure in the diagnosis and preventive treatment of tuberculosis of the lungs in infants and children.

Aug. 31, 1922, **187**, No. 9

Chronic Sepsis in Pregnancy. J. E. Talbot, Worcester.—p. 315.
Epilepsy. D. A. Thom, Boston.—p. 320.
Physician and Laboratory. F. W. Peabody, Boston.—p. 324.
Lead Poisoning. W. Wright, Boston.—p. 328.
*Treatment of Rheumatic Fever. H. F. Swift, New York.—p. 331.
Sting of Sea-Nettle. D. H. Stewart, New York.—p. 337.

Treatment of Rheumatic Fever.—An attempt is made by Swift to summarize present conception of the disease as an infection lasting longer than is ordinarily believed, to show that only certain of the well-recognized symptoms yield readily to antirheumatic drugs, and that these drugs often simply depress or mask the activity of the virus. Proper treatment consists not only in administering antirheumatic drugs, injecting foreign protein, or removing possible points of focal infection, but also in prescribing rest, guarding the heart against overstrain, regulating exercise, attending to the diet, and in devising measures to increase the patient's general resistance against infection.

Georgia Medical Association Journal, Atlanta

August, 1922, **11**, No. 8

Syphilis of Nervous System. N. M. Owensby, Atlanta.—p. 297.
Statistical Data in Connection with Examination of 734 Ex-Service Men from December 1, 1919, to November 15, 1921. W. H. Lewis, Rome.—p. 300.
Have We Drifted Too Far? S. A. Visanska, Atlanta.—p. 305.
Colloidal Gold Reaction: Diagnostic Aid of Unquestionable Value. A. G. Kelley, Atlanta.—p. 310.
Hemorrhoids. J. F. Burdashaw, Augusta.—p. 312.
Mental Disease Problem. G. L. Echols, Milledgeville.—p. 317.

Journal of Infectious Diseases, Chicago

July, 1922, **31**, No. 1

Experimental Production of Bovine Mastitis with Streptococci and Other Bacteria. C. M. Carpenter, Ithaca, N. Y.—p. 1.
Bacteria in Normal and Diseased Lungs of Swine. R. S. Spray, Chicago.—p. 10.
Local Inflammatory Reaction Produced by Tetanus Bacillus. F. H. Stangl, Chicago.—p. 22.
Biologic Properties of Pathogenic Molds. S. S. Greenbaum, Philadelphia.—p. 26.
*Specific Erythroprecipitins (Hemoglobin Precipitins?). L. Hektoen and K. Schulhof, Chicago.—p. 32.
Streptococci of Bovine Udder. IV. Studies of Streptococci. S. H. Ayers and C. S. Mudge, Washington, D. C.—p. 40.
*Immunity in Experimental Pneumonia. P. F. Clark and E. J. Murphy, Madison, Wis.—p. 51.
Precipitation of Colloidal Gold in Cerebrospinal Fluid of Horses with Dourine. F. H. K. Reynolds, Ft. Sam Houston, Tex., and H. W. Schoenig, Washington, D. C.—p. 59.
*Encapsulated Nongas Forming Bacilli. G. R. Lacy and A. C. Murdoch, Pittsburgh.—p. 64.
Specific Precipitin Reaction of Normal and Cataractous Lens. L. Hektoen, Chicago.—p. 72.
*Development of Paratyphoid-Enteritidis Group in Various Foodstuffs. S. A. Koser, Washington, D. C.—p. 79.

Specific Erythroprecipitins. — Precipitin formation in response to extracts of various corpuscles were studied by Hektoen and Schulhof on the same general plan as Klein and Leers have done. Aqueous extracts of red corpuscles give rise in rabbits to precipitins the action of which appears to be limited to erythrocytic constituents, in some cases of the species furnishing the corpuscles only, in other cases extending also to such constituents of related species. While other antigens may be present in crude aqueous extracts of corpuscles, the main precipitinogen seems to be hemoglobin, which is shown to be a species specific precipitinogen in confirmation of the early work of Ide and his pupils. Conversion of the hemoglobin in extracts of red corpuscles into carboxyhemoglobin, sulphydrohemoglobin or methemoglobin does not affect the specific serum precipitation of the hemoglobin. On splitting hemoglobin into hematin and globin by means of acetic acid, the precipitinogenic elements remain in the solution after removal of the globin, which does not appear to be responsible for the antigenic properties of the hemoglobin, the globin-free solution, however, being antigenic not only in tests with antiserum but also on injection in rabbits. While the precipitinogens in extracts of red corpuscles and in hemoglobin may exist independently of hemoglobin after treatment with acids, they ordinarily are attached closely to the hemoglobin molecule, not being removed or diminished in proportion to the amount of hemoglobin by repeated crystallization or by treatment with aluminum cream, the antigen being apparently either closely absorbed to the hemoglobin molecule or forming a part of it which can be split off by acids.

Immunity in Experimental Pneumonia.—The injection of *B. typhosus* by the intratracheal route caused bronchopneumonia, and coincidentally with recovery specific agglutinins were found in the blood by Clark and Murphy. The agglutinin titer in the group animals with pneumonia did not reach as high a level as in the group of intravenously treated animals but the peak of the curve is reached on the same day, the eighth following the injection of the bacteria. The failure of attacks of pneumonia to produce any considerable immunity is believed probably to be due, therefore, to the nature of the organism causing the disease rather than to any peculiar properties inherent in the lung tissue.

Encapsulated Nongas Forming Bacilli.—Lacy and Murdock have isolated from different sources three organisms conforming to the description of *B. pneumoniae, B. acidi-lactici* and *B. lactis-acrogenes*. his paper is a report of the morphologic, cultural, and immunilogic characteristics of these organisms. Each of the three patients was suffering from some pathologic condition of the genito-urinary tract. It was not possible to determine whether the organism was the primary etiologic factor in producing the lesions or a secondary invader.

Paratyphoid Enteritidis Group in Foodstuffs.—The investigation reported on by Koser was made to gain some idea of the ability of several type strains of the paratyphoid-enteritidis group to develop in miscellaneous foodstuffs, such as various vegetables, fruits, meats and evaporated milk. The effects of different conditions, such as temperature of incubation, the hydrogen ion concentration and the texture of the food, were considered in relation to multiplication and the ability to spread throughout the foodstuff. All the strains of the Gaertner group multiplied readily in the liquor of several common cooked vegetables, with the exception of the highly acid sauerkraut. In the fruit juices a rapid destruction of the organisms occurred. In several meat products Gaertner group organisms exhibited a marked ability to spread from one original point of inoculation throughout the foodstuff, although this occurred only under optimum temperature conditions. The development of the Gaertner group in foodstuffs is usually not accompanied by visible alteration or spoilage. The present observations on this point are in accord with the reports of previous outbreaks of "food poisoning" caused by this group of organisms.

Journal of Laboratory and Clinical Medicine, St. Louis

August, 1922, **7**, No. 11

Determination of Lactic Acid in Blood. J. J. R. Macleod, Toronto, Can.—p. 635.
*Therapeutic Use of Germanium Dioxid in Anemia. L. Kast, H. M. Croll and H. W. Schmitz, New York.—p. 643.
*Relation of Achylia Gastrica to Chronic Focal Infections and Pernicious Anemia. L. A. Levison, Toledo, Ohio.—p. 652.
II. Value of Refractoviscosimetric Properties of Blood Serum in Cancer. M. E. Bircher, Rochester, Minn.—p. 660.
Suggested Adaptation to Gasometer Method of Determination of Basal Metabolic Rate from Carbon-Dioxid Elimination. C. A. McKinlay, Minneapolis.—p. 665.
Clinical Value of Basal Metabolism Determination. R. J. Pickard, San Diego, Calif.—p. 669.
New Type of Recording Spirometer. R. Burton-Opitz, New York.—p. 681.
Self-Feeder for Rats. R. Hoagland, Washington, D. C.—p. 687.
Removable Water Bath Tops for Paraffin Embedding and Low-Temperature Evaporation. O. T. Schultz, Chicago.—p. 689.
*Injection Method for Aiding in Identification of Tapeworm Species. R. Isaacs, Cincinnati.—p. 691.
Method for Separation of Spore-Bearing Anaerobes from Other Spore-Bearing Bacteria. J. H. Brown, Princeton, N. J.—p. 692.

Germanium Dioxid in Anemia.—Sixteen patients suffering from anemia have been treated by Kast et al. with germanium dioxid, the drug being administered by mouth in 0.2 per cent. water solution. In order to dissolve the germanium dioxid it was found necessary to boil the solution for several minutes; the oxid does not precipitate out on cooling. Doses between 100 and 200 mg. of the oxid were given daily, or every two or three days until about 1 gm. had been given. There were four cases of anemia following hemorrhage, ten cases of secondary anemia and two cases of pernicious anemia. In some of these cases the germanium was found to have distinct erythropoietic action.

Relation of Achylia Gastrica to Focal Infections.—Three cases are cited by Levison in each of which patients having foci of severe infections passed through the stage of an achylia gastrica and later pernicious anemia. The assumption that long continued foci of infection may depress the gastric secretion and produce an achylia gastrica is held to be justifiable, but there is no reason to believe, Levison says, on the basis of any evidence yet brought to bear, that achylia gastrica in itself is a predisposing cause of pernicious anemia. There is clinical evidence to believe that focal infections long continued may depress the function of the bone marrow and prevent the formation and development of new red blood cells. It is urged that when achylia gastrica is discovered in a patient showing evidences of chronic focal infections that the possibility of the development of pernicious anemia be carried in mind with the view of insisting that all infections be removed in so far as is humanly possible. Achylia gastrica is used here in the sense of a depression of the gastric secretion with relation to hydrochloric acid and not necessarily with complete absence of gastric ferments.

Injection Method for Identifying Tapeworms.—A simple method for visualizing the uterus in tapeworm proglottids, to identify the species, or for demonstration purposes, as used in the wards and laboratories of the Cincinnati General Hospital for the past five years, consists in the injection of the canals with India ink. A hypodermic syringe (½ c.c.), fitted with a fine needle, is filled with India ink. The seg-

ment to be injected is held flat on a piece of glass by means of a wooden match stick or applicator, and the needle inserted into the substance of the fresh proglottid, near the lateral genital pore. With a little manipulation, one of the diverticulae of the uterus is easily entered, and the ink readily fills all the branches. Pressure between two glass slides brings out the details very clearly, and the sparsely branched organ of T. solium is easily differentiated from the more abundant ramifications of T. saginata. The method is also applicable to other cestodes, and may also be used with preserved material although the results are not as complete as with fresh. Permanent preparations may be made by preserving the flattened segment in 10 per cent. formaldehyde, dehydrating in alcohol, and, after clearing in xylol or carbol-xylol, mounting in balsam.

Journal of Metabolic Research, Morristown, N. J.

May, 1922, **1**, No. 5

*Transformation of Protein into Fat and Fat into Carbohydrate in Body. H. V. Atkinson.—p. 565.
*Immediate Influence of Alcohol Ingestion on Diabetic Glycosuria and Blood Sugar. L. S. Fuller, Morristown, N. J.—p. 609.
*Experimental Studies in Diabetes. II. Internal Pancreatic Function in Relation to Body Mass and Metabolism. Influence of Thyroid on Diabetes. F. M. Allen, New York.—p. 619.
*Clinical Observations Concerning Progressiveness of Diabetes. J. W. Sherrill, Morristown, N. J.—p. 667.

Transformation of Protein Into Fat and Fat Into Carbohydrate.—When the glycogen reservoirs of the body are low, Atkinson asserts, the ingestion of meat in large quantity results in the deposition of glycogen. The continued ingestion of much meat brings about the retention into the body of a pabulum consisting partly of glycogen and partly of fat. Only when meat in very great excess is given is fat alone retained. Morphin depresses the oxidative processes in the body. The opinion that fat is transferred into sugar is supported by Atkinson's observations. When fat alone is given to a dog in large quantities there is an increase in the blood sugar. This increase in sugar also supports the opinion that fat can be transformed into sugar.

Influence of Alcohol on Blood Sugar.—Fuller states that the immediate effect of alcohol is to reduce both hyperglycemia and glycosuria in most cases of mild or moderate diabetes. This effect is most pronounced when the alcohol is substituted for the caloric equivalent of fat, but is also frequently manifest when the alcohol is given as an addition to the previous diet. These effects are usually lacking in diabetic cases of great severity.

Internal Pancreatic Function.—Allen's experimental work has shown that thyroid excess may aggravate the symptoms of an existing diabetes, but has never been demonstrated as contributing to the actual causation of diabetes. Thyroid deficiency may partially or wholly suppress diabetic glycosuria and hyperglycemia, but this effect is rationally explained as the result of injury or cachexia. There is no indication that the intrinsic severity of the diabetes is lessened or that one deficiency can neutralize another. Neither the excess nor the deficiency experiments can properly be interpreted in favor of an antagonism between the pancreas and the thyroid or of a thyroid element in diabetes.

Progressiveness of Diabetes.—The records of five patients with the youthful severe type of diabetes are presented by Sherrill partly because obtained so largely under conditions of strict institutional supervision. They appear to be in no way exceptional, but on the contrary to correspond fully with the conditions in several hundred other patients observed during the same period, in so far as it has been possible to keep these others under exact dietetic control. These observations are opposed to the belief in a mysterious, spontaneous progressiveness of typical diabetic cases. They support the view that functional deterioration in diabetes can be traced to definite causes, particularly infections and dietary excesses, that downward progress clinically depends on the different susceptibilities of different patients to these injurious influences, and that by the strict avoidance of such influences downward progress can be largely or wholly prevented.

Journal of Nervous and Mental Disease, New York

September, 1922, **56**, No. 3

*Case of Congenital Megacolon (Hirsch-Sprung's Disease) Associated with Mental Disorder and Terminal Cerebellar Hemorrhage. N. D. C. Lewis Washington, D. C.—p. 193.
German Research Institute. E. Kraepelin, Munich.—p. 207.
Anthropology and Insanity. A. Hrdlicka, Washington, D. C.—p. 215.

Congenital Megacolon Associated with Mental Disorder.—Lewis cites the case of a man, aged 50, who had suffered from a psychosis of degenerates for fifteen years. For a number of years he was said to have had many attacks of acute abdominal distention in which the outlines and the peristalsis of the intestine could be observed on the abdominal wall. He had an unusually severe attack of ileus in 1916 and an operation was considered necessary but the acute distention was relieved by rectal tubes without surgical interference. Then he became suddenly ill, complaining of pain in his "stomach," and when examined his abdomen was found to be tremendously distended as had been the case in several previous attacks, but this one seemed much more severe than any of the others. His pulse became weak and rapid and signs of shock quickly developed. Enemas were given without relief, and he rapidly failed and died. The abdominal walls were thin, the muscles being unusually so and exhibiting fibrous replacements. The other skeletal muscles were fairly well developed. The abdominal viscera were displaced, and the space largely occupied by an enormous pelvic colon. The walls of the rectum were universally ¾ cm. thick but the intestine was not dilated; however, at the brim of the pelvis the intestine suddenly passed into a huge pelvic balloon, involving the entire sigmoid loop which had forced itself upward, occupying the upper half of the abdominal cavity. The convexity of this loop measured 1 meter, the lower end at the rectal junction measured 52 cm. in circumference and the upper end near the descending colon, 47 cm. in circumference. The walls of this loop were universally greatly hypertrophied, and particularly were the teniae coli prominent throughout. Gas and very little liquid fecal matter composed the contents of this section. This dilated structure rather abruptly changed at the sigmoid flexure and the remainder of the colon as far as the ileocecal junction was nearly twice the size of the normal, this being due to hypertrophy of the muscular walls and not to gas content. The condition is believed to have been congenital.

Minnesota Medicine, St. Paul

August, 1922, **5**, No. 8

Fractures. W. H. Magie, Duluth, Minn.—p. 451.
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Artificial Pneumothorax in Pulmonary Tuberculosis. E. K. Geer, St. Paul.—p. 469.
Repair of Peripheral Nerves. B. F. Davis, Duluth, Minn.—p. 474.
Rectal Approach to Pelvic Abscess Complicating Acute Appendicitis. J. A. Evans, La Crosse, Wis.—p. 477.
Rat and Human Disease. W. A. Riley, Minneapolis.—p. 481.
Case Reports. Case of Abscess of Transverse Sinus with Hemolytic Streptococcemia; Operation and Recovery. C. E. Connor, St. Paul.—p. 483.
Three Cases of Dislocated Semilunar Bone. R. R. Cranmer and A. R. Foss, Minneapolis.—p. 484.
Case of Brain Abscess and Sinus Thrombosis. M. G. Peterman, St. Paul.—p. 487.
Case of Fractured Pelvis. E. H. Marcum and R. J. McAdory, Bemidji, Minn.—p. 489.

South Carolina Medical Association Journal, Greenville

August, 1922, **18**, No. 8

Plan By Which Great Desire of Public for Better Health May Be Utilized by General Practitioner for His and Public's Mutual Benefit. J. A. Hayne, Columbia.—p. 218.
Aortic Insufficiency. J. F. Woods, Charleston.—p. 221.
Basal Metabolism as Aid in Diagnosis of Toxic Goiters. J. H. Cannon, Charleston.—p. 224.
Diagnosis and Treatment of Toxic Goiters. C. J. Lemmon, Sumter.—p. 226.
Surgical Treatment of Goiter; with Case Reports. C. B. Epps, Sumter.—p. 230.
Diagnosis of Cystitis. M. Weinberg, Sumter.—p. 235.
Cinematographic Academy of Medicine. S. O. Black, Spartanburg.—p. 237.
Manic-Depressive Insanity. B. O. Whitten, Clinton.—p. 238.
Post-Mortem Examinations. Plowden, H. H., Charleston.—p. 239.
Typhoid Fever; Sanitary Index. L. Banov, Charleston.—p. 240.

Virginia Medical Monthly, Richmond

August 1922, **49**, No. 5

After-Care of Abdominal Surgical Patients. O. T. Amory, Newport News.—p. 237.
Organization and Functioning of Medical Department of Division. G. Peed, Fortress Monroe.—p. 240.
Relation Between Dentist and Physician. F. Longan, Newport News. —p. 244.
Physiologic Rest to Large Bowel by Surgical Intervention. R. L. Payne, Norfolk.—p. 246.
First Aid to Injured Eye. C. P. Jones, Newport News.—p. 249.
Arteriosclerosis. T. M. Wood, Hampton.—p. 250.
Laboratory as an Aid to Diagnosis. M. B. Beecroft, Newport News.—p. 251.
Artificial Feeding of Infants. J. W. Hope, Hampton.—p. 256.
Cooperation of Physician in Preventive Dentistry. E. J. Applewhite, Newport News.—p. 258.
Congenital Pyloric Stenosis. G. K. Vanderslice and G. G. Hankins, Phoebus.—p. 262.
Effect of Our Modern Women on Future Generation. W. W. Kerns, Bloxom.—p. 265.
Diagnosis of Pulmonary Tuberculosis. H. G. Longaker, Newport News. —p. 266.
Diagnosis and Treatment of Neurosyphilis. C. M. Byrnes, Baltimore. —p. 269.
Roentgen Ray as an Aid to Diagnosis. R. A. Davis, Newport News.—p. 276.
Interpretation of Cardiac Irregularities. J. M. Hutcheson, Richmond. —p. 279.
Focal Infection and Its Relation to Obstetrics. S. Downing, Newport News.—p. 282.
Necessity for Determination of Origin of Jaundice Before Surgical Treatment. D. W. and E. S. Bulluck and R. H. Davis, Wilmington, N. C.—p. 284.

Wisconsin Medical Journal, Milwaukee

August, 1922, **21**, No. 3

Goiter Problem as it Concerns General Practitioner. E. F. Bickel, Oshkosh.—p. 87.
*Memory Defect of Korsakoff Type, Observed in Multiple Neuritis Following Toxemia of Pregnancy. F. A. Ely, Des Moines, Ia.—p. 90.
Diagnosis of Renal Tuberculosis. W. G. Sexton, Marshfield.—p. 97.
Treatment of Fractures of Hip by Whitman Abduction Method. J. W. Powers, Milwaukee.—p. 100.
Vincent's Angina. J. M. Severson, Rockford, Ill.—p. 102.

Memory Defect of Korsakoff Type in Toxemia of Pregnancy.—In the four cases cited by Ely there existed in the early months of pregnancy hyperemesis. In two cases, therapeutic abortion was performed at the end of the third month, and in one case during the fourth month. In one case, the patient went to the eighth month and was delivered spontaneously. In three cases, although there was abundance of evidence of profound toxemia before abortion, the symptoms of neuritis did not occur until a short time after the uterus was emptied. In one case, the patient struggled through the state of hyperemesis and just prior to spontaneous delivery during the eighth month, seemed to be recovering from her neuritis. In all four cases the clinical evidences of multiple neuritis were sufficiently classical to place the diagnosis beyod reasonable doubt. Two cases, because of temporary sphincter incontinence, suggested the possibility of spinal cord involvement, and in one case the irregular distribution of the muscular atrophies much more strongly suggested cord disease. In all the cases a loss of recent memory and unreliability of statement were very pronounced symptoms. In one case, retroactive amnesia was a prominent feature. In one case, death occurred after delivery, while in one case sufficient time has not yet elapsed to make a report possible. The patient is, however, convalescent. Two patients feel that they have never fully regained their original powers of immediate memory, seven and five years respectively, after the onset of their illnesses. One woman still has absence of the patellar reflexes and a slight tendency to foot drop. Ely emphasizes that toxic multiple neuritis is a frequent sequel to hyperemesis gravidarum. Multiple neuritis may develop during gestation or in the puerperium any dependable evidence of underlying infection. A mild psychosis of the Korsakoff type is very prone to occur in this type of multiple neuritis. Therapeutic abortion is, perhaps, too long deferred in many cases of hyperemesis and is the best remedial measure, and the most sure means of preventing multiple neuritis. The Korsakoff psychosis was recognized as a very common accompaniment of multiple neuritis following hyperemesis gravidarum, long before Korsakoff affixed his name to the same syndrome which he observed in alcoholic neuritis.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Laryngology and Otology, Edinburgh

August, 1922, **37**, No. 8

So-Called Prolapse of Laryngeal Ventricle, and Eversion of Sacculus. I. Moore.—p. 381.
Epidemic Cerebrospinal Meningitis from Otolaryngologic Standpoint. D. M'Kenzie.—p. 401.

Journal of Tropical Medicine and Hygiene, London

Aug. 1, 1922, **25**, No. 15

Serologic Researches on Protozoa. L. Anigstein.—p. 241.
*Intolerance of Quinin: Case Report. M. E. Barnes.—p. 246.

Unusual Intolerance of Quinin.—In the case of malaria reported by Barnes the intolerance shown was of a most marked degree, resulting in exfoliation of the skin of the scrotum, leaving an angry, purulent, denuded surface. The administration of quinin on each of four occasions was followed by identical reactions with a promptness that leaves no doubt as to the toxic effect of the drug. An attempt was made to overcome the intolerance by beginning with very small doses of quinin and gradually increasing the dosage, but the immunity thus secured was only partial and very transient, lasting only one month.

Practitioner, London

August, 1922, **109**, No. 2

Sensitization in 270 Cases of Asthma. A. Latham and F. Coke.—p. 121.
Hay-Fever: Essential Factor. N. Davies.—p. 142.
Causes and Diagnosis of Stridulous Breathing. F. H. Diggle.—p. 147.
*Chronic Appendix. C. H. Whiteford.—p. 155.
Reeducation in Relation to Spa Treatment. R. G. Gordon.—p. 166.
After Treatment of Fractures of Cervical Vertebrae by Mechanotherapeutics. E. F. Cyriax.—p. 177.
*Hemopericardium, Resulting from Rupture of Right Coronary Artery, Secondary to Chronic Interstitial Nephritis. E. J. Jones-Evans.—p. 184.

Chronic Appendicitis.—Whiteford is convinced that the enormous number of patients whose abdominal ailments are now diagnosed as chronic appendicitis chiefly are suffering with symptoms of widely varying causation and for which symptoms the appendix is not responsible. The symptoms attributed to the appendix are not explained by the pathologic findings, and are not cured by removal of the appendix; in fact, the operation frequently makes the patient worse. The chronic appendix theory hinders investigation into the causes of abdominal pain; produces laxity in diagnosis and, in operating, incisions so small that thorough examination of the abdominal contents is made a mechanical impossibility. In the layman, the operation for removal of such an appendix, because of its failure to cure and because of its after effects, is producing doubt about the necessity for operation in acute appendicitis and mistrust in the bona fides of the surgeon. Therefore, in the interests of surgeons and patients the diagnosis of chronic inflammation of the appendix as a condition requiring operation should be abandoned.

Hemopericardium from Ruptured Coronary Artery.—Hemorrhage into the pericardium, when not traumatic in origin, usually results from rupture of the myocardium, of an aneurysmal dilatation, or of vessels in a malignant growth. Certain blood conditions such as scurvy or purpura may also give rise to pericardial hemorrhage. The result is usually fatal. Evans' case is of interest since none of the foregoing conditions were present. The patient, aged 58, with no history of specific or kidney disease, had been lifting heavy sacks. While thus employed he suddenly complained of severe pain in the left side of the neck, which radiated along the left sternomastoid, down the left arm, and was most severe over the upper part of the left trapezius muscle. There were no local signs of injury, nor could any pain be elicited on deep palpation. He complained of no pain or discomfort in the chest, nor was there any dyspnea. The pulse was strong and of good rhythm. The heart sounds were normal and quite distinct, and the breathing purely vesicular. The next day he seemed better, his temperature was normal, and the pain was considerably less. Twelve hours later he died, apparently during sleep. The pericar-

dium was enormously distended with blood, one pint being removed. There was a small rupture in the right coronary artery, 1 cm. from its origin at the root of the aorta. The artery itself was slightly sclerotic, but there was no sign of aneurysmal dilatation. The intrapericardial and extrapericardial portions of the aorta showed no morbid change. Both kidneys were hydronephrotic and in a condition of chronic interstitial nephritis. The interest in this case lies in the remarkable absence of symptoms and clinical signs. The usual clinical features such as dyspnea, cardiac oppression, and syncope, were entirely wanting. The second clinical feature of interest was the site of the hemorrhage, rupture of the lenticulostriate branch of the middle cerebral artery being of common occurrence in chronic kidney disease, whereas hemorrhage from the coronary arteries is somewhat of a rarity.

Quarterly Journal of Medicine, Oxford

July, 1922, **15**, No. 60

*Creatinuria and Glycosuria in Myasthenia Gravis. B. W. Williams and S. C. Dyke.—p. 269.
*Therapeutic Value of Quinidin in Treatment of Auricular Fibrillation. A. E. Clark-Kennedy.—p. 279.
*Quinidin Sulphate in Cardiac Disease. J. Hay.—p. 313.
*Congenital Porphyrinuria, Associated with Hydroa Aestivale and Pink Teeth. L. Mackey and A. E. Garrod.—p. 319.
*Investigation of Basal Metabolism in Unstable Conditions of Certain Endocrine Glands. H. G. Hill.—p. 332.

Creatinuria and Glycosuria in Myasthenia Gravis.—In the four cases of myasthenia gravis investigated by Williams and Dyke creatinuria was present. In one case considerable amounts of creatin were passed while the patient was on a "creatin-creatinin-free diet." Inability to deal with comparatively small amounts of creatin, when given by mouth, was observed in two cases. Creatinuria appears to be a definite feature of myasthenia gravis. The two cases examined showed a somewhat low muscle creatin percentage. This creatinuria appears to be connected with defective carbohydrate metabolism, the defect being probably located in the muscles.

Value of Quinidin in Auricular Fibrillation.—The clinical histories, treatment and progress of twenty cases of auricular fibrillation treated with quinidin are given by Kennedy. The cases are classified in three groups. Group A includes those cases in which quinidin has led to a return to normal sino-auricular rhythm which has persisted until the patient was discharged. Group B includes those cases in which only a transitory return to normal rhythm was effected, and in which relapse into fibrillation occurred prior to their discharge from hospital. Group C includes those cases in which quinidin has failed completely to exert this action. Group A is divided into two subgroups, 1 and 2. Subgroup 1 includes those cases in which auricular fibrillation has been of comparatively short duration, and which prior to the admission to hospital, during which they were submitted to the action of quinidin, had received no previous digitalis treatment. Subgroup 2 includes those cases in which fibrillation has been of comparatively long duration, and which prior to quinidin administration had received definite courses of digitalis therapy. For details the original paper should be consulted.

Quinidin in Heart Disease.—Hay's experience of quinidin sulphate is confined to fifteen cases. In twelve of these fibrillation was established and of some standing; in one it appeared towards the end of an attack of acute pneumonia; in another it was paroxysmal and the remaining patient was suffering from paroxysmal tachycardia. In six of the twelve established cases quinidin failed. Of these six one patient was so intolerant of the drug that it had to be discontinued after the first dose. In three of the patients pure flutter developed. In one of the three this gave way to a normal rhythm, in another the flutter persisted after the quinidin was stopped, and in the third fibrillation returned while under treatment. Of the seven in whom fibrillation was arrested relapses have occurred in two. In four the improvement has been pronounced and the cardiac reserve has been considerably increased. There was one death among the fifteen. This occurred in a patient suffering from paroxysmal tachycardia. The paroxysm had been cut short, and the patient appeared to be progressing satisfactorily when suddenly, without warning, she died. Death occurred twenty-four hours after the cessation of the abnormal rhythm and after 2 gm. quinidin had been taken. No necropsy was permitted.

Congenital Porphyrinuria and Pink Teeth.—Mackey and Garrod record a fresh example of an extremely rare inborn error of metabolism. In their case the evidence of congenital onset is more complete than in any recorded previously. No other case of the anomaly is known to have occurred in the family of the patient, and his parents are not blood relations. The boy presents the usual association of porphyrinuria with extreme sensitiveness of the superficial tissues to light, as shown by annual eruptions of hydroa castivale, vel vacciniforme, on the exposed surfaces of his skin. The case is quite exceptional in the deep pink coloration of the milk teeth. The only other patient observed at so early an age (6 years) showed no such coloration of his teeth. Transillumination of the hands affords very strong evidence that the bones also are deeply pigmented. A roentgenogram shows that ossification of the carpal bones is delayed. A résumé is given of the cases of congenital porphyrinuria previously described.

Basal Metabolism in Endocrine Disturbances.—The results of Hill's series of basal metabolism estimations in gross disorders of the thyroid gland agree with those of other observers, and indicate the great value of this method of examination in estimating the degree of glandular activity prevailing at the time of observation; the method also provides a reliable guide as to the success of various methods of treatment. In gross disorders of the pituitary gland, results more or less analogous to those found in the case of the thyroid have been obtained, and have proved of equal value in the diagnosis and treatment of these conditions. Estimations of the basal metabolism at the physiologic epochs of life in persons, especially women, who show any tendency to thyroid or pituitary instability, are of great value in confirming any early abnormality and indicate the lines for suitable treatment. In children suffering from nocturnal enuresis the value of basal metabolism estimations has been established. An indication is obtained as to those likely to derive benefit from treatment with glandular extracts. In an investigation of patients suffering from phenomena which are apparently due to parasympathetic over-excitability, a group of cases has been isolated showing a subnormal basal metabolic rate. These persons benefit greatly from organotherapy.

Tubercle, London

August, 1922, **3**, No. 11

Tidal Expansion of Kronig's Areas. A. N. Robertson.—p. 481.
*Buccal Infection with Bacillus Tuberculosis. S. R. Gloyne.—p. 497.

Buccal Infection with Tubercle Bacillus.—Fifty per cent. of twenty phthisis patients with tubercle bacilli in their sputum were found to have virulent tubercle bacilli in their mouths. The group with profuse expectoration yielded a larger percentage of positive results (80 per cent.) than the group with scanty expectoration (20 per cent.). Sixty per cent. of the group with profuse expectoration were found also to infect the spoons used, whereas none of the group with scanty expectoration did so. Other table utensils were not found to be infected. Plain water, if used in sufficient quantity, appeared to be a satisfactory sterilizing agent.

Annales de Médecine, Paris

July, 1922, **12**, No. 1

*Necrotic Dissecting Pneumonia. M. Letulle and F. Bezançon.—p. 1.
*The Palm-Chin Reflex. A. Radovici.—p. 56.
*Pituitary Extract as Muscle Tonic. C. I. Urechia and F. Graff.—p. 64.
*The Striatal Syndrome in Children. L. Babonneix.—p. 70.

Dissecting Pneumonia.—Letulle and Bezançon conclude from their study of four cases that a fibrinous pneumonia is liable to become complicated with a special infection, subacute and necrotic, capable of destroying a large proportion or the whole of the altered parenchyma. The contrast is striking between the foci of acute progressive necrosis and the oases of prompt cicatricial repair. If the disease can be recognized early and the necrotic pneumonia be arrested by

an operation in time, the patient might be saved the secondary suppuration of the lung parenchyma. The photomicrograms from their cases are reproduced. An operation was done in one case but the condition was too grave for recuperation. The symptoms of very grave pneumonia are not accompanied by the usual physical findings. Expectoration is profuse, purulent and hemorrhagic, and by the eighth or ninth day there are signs of a focus. In a few days more there are actual vomicas of creamy hemorrhagic pus, never fetid. The profuse expectoration keeps up, the dyspnea is intense, and the patient dies in marasmus in the fourth or fifth week of the disease. A few specimens of the Friedländer pneumobacillus and streptococci were found. No benefit was observed under vaccine therapy which was given in one case.

The Palm-Chin Reflex.—Radovici asserts that the behavior of the palm-chin reflex is an index of the site of lesions in the pyramidal tract. This reflex is elicited by rapidly and vigorously irritating the thenar eminence with a needle. The muscles of the chin on that side are drawn up, sometimes forcing up the lip. The lips should be relaxed, the mouth partly open. He gives a chart to explain the mechanism.

Pituitary Extract as a Muscle Tonic.—Urechia and Graff advocate pituitary extract in treatment of parkinsonism and somnolency. Their extensive tests indicated that it has a decided influence on striated muscle, increasing the energy and the amount of work accomplished.

The Striatal Syndrome in Infants.—Babonneix remarks that a striatal element is evident in some of the motor disturbances of cerebral origin in infants. He ascribes this to injury of some vessel in the corpus striatum, and this in turn is the result of stasis of the blood in the cerebral veins, for which the difficult delivery was responsible. This lesion may arrest development and entail a striatal agenesia. It differs from the striatal agenesia observed soon after birth only in the fact that it is persisting, instead of subsiding within a few months.

Bulletin Médical, Paris

July 29, 1922, **36**, No. 31

*Permanently High Blood Pressure. A. Clerc.—p. 609.
*Heart Disturbances with High Blood Pressure. R. Lutembacher.—p. 616.
*The Mishaps with High Blood Pressure. E. Donzelot.—p. 619.
*The Treatment of High Blood Pressure. A. Mougeot.—p. 621.

Aug. 5, 1922, **36**, No. 32

What a Physician Should Know of Vaccine Therapy. G. Lyon.—p. 633.

Permanently High Blood Pressure.—This number is entirely devoted to high blood pressure. Clerc concludes his article by saying that our present knowledge of permanently high blood pressure is as vague as ever, only a little less obscure. From the therapeutic standpoint, owing to the complexity of the disturbances, there is no radically effectual treatment. Reducing the intensity of the symptoms, warding off the disturbances they may entail and the danger are the tasks for which the physician must be prepared. The articles that follow show the various means of defense at his disposal to accomplish this.

Aug. 12, 1922, **36**, No. 33

*Movable Gallbladder. T. Asteriades.—p. 649.

Movable Gallbladder.—This is an anatomic, clinical and therapeutic study of ptosis and volvulus of the gallbladder. Intermittent dropsy of the gallbladder and movable gallbladder are different affections, although the latter may be a factor in the former. The characteristic signs of ptosis of the gallbladder are very variable. The clinical picture is sometimes so complicated, the pains so irregular, the symptoms apparently so diametrically opposed to the existing lesion, and the nervous system so upset, that without a minute and methodical examination of the patient the real disturbance would be overlooked. Volvulus of the gallbladder is extremely rare and mention is made in the literature of only eight cases. As a rule, volvulus of the gallbladder is found only in elderly women, feeble, emaciated, and who had complained several years before of pains in the right hypochondrium radiating to the loins and lower abdomen. It can easily be mistaken for appendicitis, intestinal occlusion, cholelithiasis or strangulated hernia. Immediate operative treatment is required, with cholecystectomy.

Aug. 19, 1922, **36**, No. 34

*Pneumonic Plague. P. Delbreil.—p. 669.

Primary Pneumonic Plague.—Delbreil has found the period of incubation in man from one to three days. The onset of the disease is not characterized by any special features and although the patient's condition grows rapidly worse and the clinical picture becomes alarming, the stethoscopic signs remain almost the same. At the hospital for natives at Dakar, in his charge, there were sixty-two cases in 1914-1915, and thirty-two cases in 1919, and all the patients succumbed to the disease. At the onset of the disease, with the early, repeated chills, high temperature, and tachycardia, the latter may be overlooked as it coincides with the rising temperature. It is important to detect any change in the respiration, as dyspnea is an early feature, with a certain amount of distress. The diagnosis of pneumonic plague is very difficult at the onset, and is practically impossible when the plague first makes its appearance in this pneumonic form. Although Delbreil insists on the rapid and grave onset of the disease, he adds that in certain cases there is a latent period for one or two days, with moderate or irregular temperature and slight tachycardia; the dyspnea has to be looked for, and the cough does not appear till later.

Gynécologie et Obstétrique, Paris

June, 1922, **5**, No. 6

*Research on Ovarian Function. III. G. Schickelé.—p. 425.
*Primary Cancer of the Ovary. G. Schickelé.—p. 446.
Corpus Luteum Cysts. R. Keller.—p. 458.
*Primary Abdominal Pregnancy. P. Jacquin.—p. 492.
*Metastasis in Eye of Puerperal Infection. P. Luttringer.—p. 513.
*Vegetative Nervous System in Menstruation. J. Kreis.—p. 543.
Duration of Pregnancy. G. Schikelé.—p. 590.

Research on Ovarian Functioning.—All the articles in this number issue from the clinic for women at the University of Strasbourg, of which Schickelé has charge. The functioning of the ovary is being studied intensively there.

Primary Cancer of the Ovary.—In the woman of 45, with nine living children, both ovaries were affected with the malignant disease. The neoplasms had developed rapidly, with metastasis. Schickelé describes them as a new kind of *néoplasme glandulaire mucipare*, and ascribes them to congenital inclusion of some scrap of entoderm.

Primary Abdominal Pregnancy.—Jacquin concludes from his review of the literature and a case personally observed that the ovum may become embedded primarily in the peritoneum. The pouch of Douglas or its vicinity was the seat in the nine cases on record. The few instances of embedding on the liver, etc., are conclusive as to the primary nature of the phenomenon. In Lane's case the child was living, at term, the placenta in the lumbar and kidney region; this is the only instance, he says, of a viable child.

Puerperal Ophthalmia.—Luttringer relates that in the six cases of metastasis in the eye of puerperal infection, observed at Strasbourg since 1900, all proved fatal. There was also metastasis in other organs. In Axenfeld's compilation of sixty-nine cases, both eyes were affected in twenty-seven cases, and 66 per cent. of the women died.

The Tone of the Vegetative Nervous System in Relation to Menstruation.—Kreis asserts that the play of the antagonist systems in the vegetative nervous system is more complex than has been hitherto recognized. The abnormal conditions are more variable, and may affect only part of the system. In some cases of amenorrhea described, excessive vagotony became reduced to normal as menstruation was reestablished or was started by ovarian and other treatment. Tests for excessive tonus in the vagus or sympathetic system may clear up many dubious conditions, and serve as a guide to treatment in endocrine derangement.

Journal de Chirurgie, Paris

August, 1922, **20**, No. 2

*Technic for Urano-Staphylorrhaphy. V. Veau and C. Ruppe.—p. 113.
*Genital Prolapse in Elderly Women. G. Cotte and J. Creyssel.—p. 145.

Correction of Cleft Palate.—Veau and Ruppe insist on the necessity for improving the usual methods for this purpose, as their reexamination of 89 children years after urano-

staphylorrhaphy showed a total failure in 15 per cent. after a single operation, and in 2.6 per cent. even after repeated interventions, while there was no improvement in speech in 90 per cent. They here describe with thirty-two illustrations a method which closes the gap with a double bridge, one plane made from the mucous membrane of the nose and one from the mucous membrane of the mouth. The nasal mucosa is easily separated through an incision on each side of the palate, and it is sutured through an incision on the median line. Before the threads are drawn up, the muscles are sutured together with wire, the long U sutures taken through the side incisions to embrace nearly the whole width of the palate, but not including any of the mucosa. The removal of the wire later is difficult, but they have had no mishaps with this technic in the 35 cases in which it has been applied. The muscular suture can always be done, but conditions may prevent the suturing of the mucous membranes in two planes. When it is practicable, it insures rapid healing.

Genital Prolapse in Elderly Women.—An illustrated description is given of a modified Le Fort technic. The walls of the vagina are freshened and sutured to buttress the sagging uterus.

Journal de Médecine de Bordeaux

July 25, 1922, **94**, No. 14

*Retrobulbar Injection of Procain-Epinephrin. C. Fromaget.—p. 451.
The Fight Against Cancer. J. Bergonié.—p. 455.

Retrobulbar Injections of Procain-Epinephrin.—Fromaget extols the many advantages of these injections in eye surgery. After a retrobulbar injection of 3 c.c. of a 2 per cent. solution of "allocain" containing 2 drops of epinephrin per c.c. in a man of 60 with uveitis of the left eye, with complete seclusion of the pupil, the dull aspect of the cornea disappeared in a few minutes and the iris became visible. The transparency in the upper part of the membrane was perfect and the circumference of the pupil was plainly visible. In a second case with complete loss of vision of one eye due to sclerochoroiditis, terminating in large buphthalmia, and the affection starting in the other eye, after retrobulbar injection of 3 c.c. of allocain, in four or five minutes the cornea became clear except for a few spots where the sclerosing keratitis was apparent. As the eye became clearer, the ocular tension decreased. Sclerectomy and iridectomy were successful without prolapse of the iris. This shows that procain-epinephrin injections, besides being the best anesthetic, can entail almost complete disappearance of glaucoma and reduce the ophthalmo-tonus. This property facilitates the operator's work as he can follow the knife through the cornea and prevent serious accidents in operations for hypertension of the eye. He reports several other cases in which the retrobulbar injection proved to be of great advantage, and concludes that with the many advantages obtained with retrobulbar injections, general anesthesia will soon be discarded in operations on adults, except perhaps in exceptional indications, and for children.

Journal de Radiologie, Paris

July, 1922, **6**, No. 7

The Normal Stomach. Lebon and Colombier.—p. 301.
Physiologic and Therapeutic Action of High Frequency Currents. Ronneaux and Laquerrière.—p. 321.
*Plastic Substances in Radium Therapy. A. Esguerra et al.—p. 331.

To Hold Radium Applicator Against the Surface Being Treated.—Esguerra, Monod and Richard give a long list of substances that have been used to hold the radium applicator in place. In their work at the Radium Institute of the University of Paris they use a sheet of a hardened paste made of wax, liquid petrolatum and finely pulverized sawdust in the proportions of 100 parts, 100 parts and 20 parts. This thin sheet is softened in hot water and fitted like a cast to the surface to be treated. It is then removed and the radium tubes are placed in position on the inside of the cast, as they explain in detail. The cast is then applied and held in place with adhesive plaster or bands. They enumerate a number of advantages with this "colombia paste." It is perfectly plastic heated to 48 C.; is easy to model to any region, and does not soften at the temperature of the body.

Néoplasmes, Paris

March 15, 1922, **1**, No. 2

*Experimental Reproduction of Sarcoma of the Liver in the Rat. F. D. Bullock and M. R. Curtis.—p. 33.
*Serodiagnosis of Cancer. J. Thomas and Binetti.—p. 54.
Is Radiotherapy Dangerous? C. Schmitt.—p. 60. Conc'n No. 3, p. 94.
Intensive Roentgen Ray Treatment of Cancer. A. J. Rivière.—p. 64.

Experimental Reproduction of Sarcoma of the Liver in the Rat.—This experimental work was done at the Institute of Cancer Research. Bullock and Curtis summarize the results of similar research by others, and bring their own report down to date. They now have 210 rats in which sarcoma was induced by feeding with cat feces containing the ova of *Tenia crassicollis*. Their experiments included 1,165 rats and 2,500 descendants through five generations. The metastases and the 90 per cent. transplantable sarcomas amply confirmed the malignant nature of the neoplasms. The primary neoplasms always developed in the wall of the cyst in the liver, the work of the larval stage of this tenia, *Cysticercus fasciolaris*. Seventeen illustrations accompany the article.

Serodiagnosis of Cancer.—Thomas and Binetti relate that the serum from a cancer subject hastens decoloration in tests with cancer extract and methylene blue in a set of test tubes. With normal serum and the serum of the tuberculous and the syphilitic, the decoloration takes an hour to occur, and is manifest only in the tubes containing the larger amounts of the extract. With serum from cancer subjects, decoloration occurs in half the time, and in all the tubes. The test is made with 5, 10, 15 and 20 drops of serum (man, sheep, horse) plus 15, 10, 5, 0 drops of distilled water, plus 1 drop of a 1:300 solution of methylene blue to which 1 c.c. of glycerin has been added. Thus applied, the tint of the fluids persists unmodified for two hours at least. Repeating the test with an extract of the total lipoids from a maceration of cancer tissue, using this instead of the serum, the tint of the fluids persists for two hours, at least, in the same way. Repeating the test with progressively increasing amounts of the serum plus diminishing amounts of the cancer extract, plus 1 drop of the stain, results in decoloration of the fluid, but it takes fully an hour, and it occurs only in the tubes with the largest extract content. When the serum is from a cancer subject, however, instead of from a normal, a tuberculous or a syphilitic subject, the decoloration is accelerated, and it occurs in the whole set of tubes. Tests of 63 noncancerous serums were constantly negative, while the response was positive in 39 cancer cases, including 10 of the breast, 9 of the uterus, 5 of the prostate, 5 of the rectum, 2 of the stomach and 3 of the tongue. The baffling fact was noted that this serum test was positive in subjects apparently free from cancer but with a cancer parent. The positive response in 4 of the cases veered to negative a month after removal of the neoplasm. They intend to repeat the test later on these subjects. In one dubious case with pains in the gallbladder-pylorus region and cancer in a parent, the test was positive, but became negative six weeks after a course of mesothorium bromid injections.

Presse Médicale, Paris

July 19, 1922, **30**, No. 57

*Familial Diseases. E. Leredde.—p. 609.
*Postoperative Mishaps Due to Ascarids. C. Lefebvre and Baillat.—p. 612.
Clinical Study of Oscillometer Curve. A. Pruche.—p. 613.

Familial Diseases.—Leredde entitles his article, "Is there such a thing as spontaneous generation of diseases?" In a recent case of familial exophthalmic goiter, syphilis was finally proved to be a factor, and treatment to eliminate this factor cured the previous rebellious thyroid disease. All thyroid affections are of a familial type, he says, but adds that the familial element is merely the local vulnerability. Heredity creates a familial inferiority of this or that organ, and syphilis, by its frequency, its character of chronic infection in the fetus, the child and later, is practically the only hereditary, congenital infection, and it is the only one transmitted beyond one generation. He says that there is no organ and no system in which familial affections may not be observed, but heredity does not create diseases, although it may be responsible for anomalies, malformations, morphologic, physiologic and physiochemical defects. The share of syphilis in univitelline twin pregnancies, and in certain

dystrophies preceding placental life is still a question. Every malformation is presumptive evidence of syphilis, but certain hereditary conditions, such as hemophilia, are transmitted through so many generations that inherited syphilis can scarcely be held responsible for them.

Ascarids Complicating Laparotomies.—Four cases are described in which postoperative subacute peritonitis seemed certain. The symptoms had developed suddenly, with profuse vomiting and the peritonitis facies, but the local findings were not severe enough to harmonize with the grave general symptoms. In all four cases the symptoms subsided after an ascarid had been found in the vomit. Lefebvre has been unable to find any analogous cases on record although ileus, etc., from ascarids is not a rare postoperative complication.

July 26, 1922, **30**, No. 59

Bismuth in Treatment of Syphilis. C. Levaditi.—p. 633.

July 29, 1922, **30**, No. 60

*The Mechanism of the Heart's Compensating Action. E. H. Starling.—p. 641.
Arsenical Treatment in Anemia. L. Cheinisse.—p. 646.

Mechanism of Cardiac Compensation.—This is Starling's interchange lecture delivered at the Paris medical school. He describes his research in experimental physiology of the heart during the last ten years.

Aug. 2, 1922, **30**, No. 61

*The Lipoids. H. Iscovesco.—p. 653.
*Compensating Hypertrophy of Vessel Walls. G. Billard and A. Mougeot.—p. 655.

Lipoids.—Iscovesco suggests the term "adipoids" for all the fat substances, to correspond to the term proteins for the albuminoids. The lipoids are adipoids, not colloids, and always have at least four and often five elements while cholesterin has only three. The latter always accompanies the lipoids, and seems to balance them in some way. He mentions his own experimental research with feeding lipoids from different organs. He has demonstrated, he says, that the beneficent action of cod liver oil is due to the liver lipoids it contains. Other facts established are that the lipoid content of an organ grows less when the organ is diseased, and that lipoids incorporated go to settle in the organ corresponding to the organ from which they were derived. This assumption has been amply confirmed by treatment on this basis. Liver lipoids have the same beneficial action as cod liver oil, and even more rapid, constant and regular. Heart lipoid, he says, is perhaps the most potent and the most harmless of heart tonics. Erythrocyte lipoid aids in the regeneration of the blood. If there is actually a vitamin A, it certainly is at its maximum in liver and pancreas lipoids. It is probable that a deficiency of lipoids is a factor in certain cases of endocrine insufficiency, and it is in our power to remedy this by administering the proper lipoids.

Compensating Hypertrophy of Muscle in Artery Walls.—Billard and Mougeot warn that the walls of the small and medium arteries may become thicker and harder as a physiologic compensating phenomenon in persons doing hard manual work. This salutary compensating hypertrophy of the muscular wall of the artery must not be mistaken for arteriosclerosis. There is none of the tortuous course of a sclerotic vessel.

Progrès Médical, Paris

July 1, 1922, **37**, No. 26

*Sodium Sulphate and Cholesterinemia. M. Loeper and E. M. Binet.—p. 301.
Thermotherapy and Physiotherapy in Chronic Intestinal Stasis. J. Baumann.—p. 301.
Lupus Erythematosus. L. Lortat-Jacob.—p. 303.

Action of Sodium Sulphate on Cholesterinemia.—Chauffard and Grigault have shown the dangers of accumulation of cholesterin in the organism and tissues. This accumulation may be due to physiologic hypersecretion, to excessive intake in food, or to obstruction to bile elimination. This increase of cholesterin in certain cases of obstruction of the common bile duct justifies this hypothesis, while any exaggeration of bile secretion and elimination reduces the cholesterinemia. Up to the present time the action of alkalines in this line has been studied, but the action of purgatives has received little attention. Loeper and Binet chose for experiment sodium sulphate, rhubarb and phthalein. The results showed lower cholesterinemia whatever the initial amount. But it was far more pronounced with sodium sulphate than with rhubarb and phthalein, as the drop averaged 0.50 gm. with the former and ranged only from 0.01 to 0.14 gm with the two others.

July 8, 1922, **37**, No. 27

Treatment of Fibroma During Pregnancy. Chifoliau and Benoiste-Pilloire.—p. 313.
Differentiation Between Imaginary and Real Illness in Women. Dalché.—p. 316.
Alkaline Bromids. H. Codet.—p. 318.
Ancient Medicine in Morocco. J. Avalon.—p. 319.

July 29, 1922, **37**, No. 30

*The Standardization of the Wassermann Test. L. Bory.—p. 349.
*Improved Ampule. L. de Saintrat.—p. 351.
Local Treatment of Gonorrhea. Legueu.—p. 352.
Ovarian Opotherapy. E. François.—p. 354.

The Standardization of the Wassermann Test.—Bory emphasizes the necessity for imposing on all laboratories a standard technic for the Wassermann test. In the present state of things, the only way to standardize the Wassermann test is to impose such technical conditions that the personal factor, which is the principal cause today of variations in results, will be practically eliminated. All serologists should be required to make regularly simultaneous tests both with heated serum and with fresh serum not heated; to use for the heated serum tests at least three or four antigens of different known and tested sensitiveness. (This is to prevent a weakly potent serum being considered as negative when an antigen of weak sensitiveness is used, and as strongly positive when a very sensitive antigen is employed); the preliminary titration of complement in presence of these various antigens, and finally, with the antisheep corpuscle hemolytic method, the preliminary titration of the normal hemolytic power of the serums to be analyzed. Without this latter precaution, no negative result can be considered absolutely reliable. This source of error, although known to serologists, is so frequent that many regrettable mistakes have been the result of such negligence. Although all these tests seem to require much time and considerable material, as five or six reactions are necessary for one analysis, Bory states that the adoption of this standard would be an important help to syphilography. He has been using it himself for several years.

Improved Ampule.—De Saintrat describes his new ampule allowing the chemical and its solvent to be kept in different compartments in the same ampule, the solution being made at the time of injection only, thus eliminating the use of two ampules.

Revue Franç. de Gynécologie et d'Obstét., Paris

May, 1922, **17**, No. 5

*The Slope of the Pelvis. L. Demelin.—p. 273.
*Exploratory Ovariotomy. G. de Rouville.—p. 286.
*Peritoneal Fibromyoma. G. de Rouville and Trzélépoglou.—p. 289.
*Treatment of Inoperable Uterine Cancer. L. Chevrier.—p. 291.

The Slope of the Pelvis as Affecting the Use of Forceps.—Demelin's study of the normal pelvis and his experiences with forceps delivery have demonstrated, he says, that the minimum of force is required for extraction when the woman is in the Devraigne position, that is, the thighs drawn up close to the pelvis, the legs flat on the thighs, the knees spread apart a little to prevent their pressing on the abdomen, and to stretch the pubic bones apart by pulling on the interpubic fibrocartilage. He explains how this position brings the superior strait into almost a right angle to the central line of direction for the expelling forces of the uterus and abdomen. This provides the most favorable conditions for the action of the expelling forces and for application of forceps. The anterior surface of the sacrum forms almost a straight line with the lumbar spine, thus practically obliterating the promontory. When the head has advanced to the rotation point, he turns the woman into the regular obstetric position, and when rotation is complete restores her to the Devraigne position once more.

Exploratory Ovariotomy to Distinguish Between Uterine Fibromyoma and Pregnancy.—De Rouville comments on the difficulty in certain cases of recognizing gestation in a fibro-

matous and even in a normal uterus. In two such puzzling cases it was impossible to say whether the symptoms observed were due to a fibroma in the uterus or whether the woman was pregnant. The evidence apparently testified in favor of fibroma, but the aspect of the uterus at the laparotomy suggested doubts. To make sure, he slit each ovary from the convex margin to the hilus, but no corpus luteum could be found in either. This encouraged him to remove the uterus, and it proved to be nongravid. In a third case the slitting of the second ovary—the first was negative—revealed a large corpus luteum. The pregnancy continued unmolested to term. Of course time will always solve the problem, but if the abdomen has been opened, then this exploratory ovariotomy will satisfy the last doubt. He takes a few catgut stitches to close the incision in the ovary.

Peritoneal Fibromyoma.—The pedunculated subperitoneal fibromyoma in the left iliac fossa had no connection with the uterus or its ligaments.

Intra-Abdominal Radium Treatment of Inoperable Uterine Cancer.—Chevrier compares some recent discussions of this subject, citing Savariaud's two cases with survival for five and seven years, and Souligoux' one survival for seven years, after vaginal exposures alone. Still better results seem to be promised by the intra-abdominal exposures which Schwartz and Proust have recently been applying. Chevrier criticizes their practice of making the intra-abdominal exposures first, saying that it would be safer to give the vagina treatment first, and allow from fifteen to twenty days for recovery from the shock before the laparotomy. He describes the exact technic followed to date.

Archivio Italiano di Chirurgia, Bologna

July, 1922, **5**, No. 5

*Nourishment During Operations on Stomach. D. Fieschi.—p. 467.
Cystic Hygroma on the Neck. N. Giannettasio.—p. 475.
*Movable Kidney and Appendicitis. C. Silvan.—p. 483.
Foreign Bodies in the Bladder. A. Catterina.—p. 520.
*Effect of Malaria on Trauma and Surgery. F. Cioffi.—p. 533.
Blood Cyst on Ascending Colon. E. Leo.—p. 559.

Nourishment During Operations on Stomach.—Fieschi describes how he pours into the bowel, as soon as the abdomen is opened, a liter of some nutrient fluid, before commencing the operation on the stomach. He makes the minute incision for it in the loop which he designs for the gastro-enterostomy. He says that in his last 200 operations for stenosis of the pylorus, only ten of the patients were in such extreme debility from the long inanition that he regarded this *nutrizione interoperatoria* as indicated. He is confident that it was an important factor in the prompt recuperation.

Movable Kidney and Appendicitis.—Silvan relates that in 28,000 operative cases at the Venice hospital in twenty-eight years there were 893 cases of appendicitis and 195 of movable kidney, but the two were combined in only fifty-one instances. This is a proportion of 26.1 per cent. The appendix can be removed without difficulty through the lumbar incision for the kidney.

Malaria in Relation to Trauma.—Cioffi's data confirm anew the tendency for latent malaria to flare up after trauma affecting the bones or the spleen. The evidence is not conclusive as yet on whether trauma or surgery affecting other regions may rouse latent malaria. He thinks this is very dubious.

Pediatria, Naples

Aug. 1, 1922, **30**, No. 15

*Vein Sign of Glandular Disease in Children. O. Cozzolino.—p. 689.
*Leukolytic Power of Blood Serum. G. Caronia.—p. 693.
Infant Mortality in Palermo. S. Maggiore.—p. 703.
*Transmission of Internal Leishmaniasis. R. Vaglio.—p. 728.

Vein Sign of Tracheobronchial Glandular Disease in Children.—Cozzolino has noticed that young children with tuberculous bronchial glands have a bluish cord along the midaxillary line. This cord is the swollen and turgid vein formed by the junction of the thoracic and superficial epigastric vein. The veins on the chest may show some dilation, but usually this one vein is the only one affected. In small children the space between the anterior surface of the trachea and the superior vena cava is extremely small, and any enlargement of the glands in this region interferes with the local circulation, and this bluish cord appears.

Leukolytic Power of Blood Serum.—Caronia's research has confirmed that the blood of children with leukopenia has a leukocyte destroying action. The substances which display this leukolytic action are destroyed by heating, but are not affected by addition of 0.5 per cent. phenol.

Transmission of Internal Leishmaniasis.—Vaglio concludes from his analysis that all the evidence points to the bedbug as the means of transmission of kala-azar. Further research is needed on the relations between leishmaniasis in human beings and in dogs.

Anales de la Facultad de Medicina, Montevideo

March-April, 1922, **7**, No. 1-2

*The Major Disorders of Nutrition. M. Labbé.—p. 8.
*Mumps Meningitis in Children. L. Morquio.—p. 23.
Operative Treatment of Gastric and Duodenal Ulcer. H. Garcia Lagos.—p. 47.
Gastroduodenal Surgery. D. Prat.—p. 76.
*Traumatic Epicondylitis. E. Blanco Acevedo.—p. 88.
The Tartrobismuthate of Potassium and Sodium. L. M. Otero.—p. 93.

The Major Derangements of Nutrition.—Labbé refers mainly to obesity, and explains its pathogenesis as an upset in the balance of matter and energy, the receipts outweighing the outgo. The task is to correct this by tipping the balance in the other direction, reducing the receipts and increasing the disbursements of the organism. The diet must be arranged to impose new organic habits proportioned to the physiologic requirements, so that when obesity has been overcome there will be no tendency to put on fat again. Copious drinking promotes kidney functioning and aids in throwing off the extra weight. Salt should be used very moderately, but proteins are required to protect the muscles. The aim is to get rid of the extra fat while sparing muscle tissue. Proteins in moderate amounts at first, and then, toward the close, in large amounts aid in repair while the patient continues to lose weight. One such patient gained 3 kg. in muscle weight while he was losing 22 kg. in weight. Medical gymnastics, walking, sports, sea and river bathing, cold douches, etc., are useful, but there is only one drug that is effectual, and this only when associated with dieting, etc. This is thyroid extract, and it has to be given with great caution. Massage is useful only to render the tissues more supple, but electric gymnastics have given good results in his hands. Heart tonics, laxatives and sedatives have their indications.

Mumps Meningitis in Children.—Morquio remarks that meningitis as a manifestation of mumps is comparatively common at Montevideo while it is almost unknown at Buenos Aires. This difference in the course and pathologic reaction in adjacent countries has been observed in many diseases. Several cases of mumps meningitis have been published in France, but German literature scarcely mentions it. He has observed numbers of cases, and the symptoms may suggest tuberculous meningitis or there may be a sudden storm/ onset with high fever, convulsions, and contractures suggesting cerebrospinal meningitis. There is usually vomiting at first; in one case it kept up for nearly two weeks. The meningitis may precede, accompany or follow the parotitis, and in some cases the meningitis was the only apparent manifestation of the disease. The puzzling clinical picture in this group was explained only by the appearance later of frank cases of mumps in the environment. In one case the meningitis did not appear till two months after the mumps. Another child had mumps meningitis and two months later developed tuberculous meningitis. The rule is, however, that recovery is prompt and complete, but deafness was entailed in some of the cases, total and definite in a few.

Traumatic Epicondylitis.—Blanco reports two cases and relates that in these and in the six or eight others he has seen, repose and relative immobilization cured in time. There is no swelling or edema, and he thinks the trouble is some slight injury of the tendon. Massage is not only useless but does actual harm. Franke partially resected the epicondyle in one young woman who complained of atrocious pains; in this case the bone showed signs of slight inflammation.

Archivos Latino-Amer. de Pediatría, Buenos Aires

June, 1922, **16**, No. 6

*Pediatric Bibliography. J. A. Trillo.—pp. 97-180.

Bibliography in Pediatrics.—This is the concluding half of the classified index of the publications of the pediatricians of Argentina and Uruguay.

Prensa Médica Argentina, Buenos Aires

July 20, 1922, **9**, No. 5

*Saprophytism of Causal Agents of Venereal Disease. S. Mazza, S. Sonnenberg and C. Guerra.—p. 117.
Case of Colibacillosis. R. Vieyra.—p. 119.
Asthma. Pablo M. Barlaro.—p. 119. Cont'n.
Treatment of Sebaceous Cysts. D. S. Cuneo.—p. 127.
*Treatment of Hydrocephalus. R. Ortega Belgrano.—p. 128.

Venereal Disease Agents as Saprophytes.—No spirochetes were found in the vaginal secretions of 110 healthy prostitutes examined, but gonococci were found in 28 per cent. of 171 specimens of vaginal secretions from these women. The Wassermann test was positive in from 20 to 37 per cent. in the different series examined.

Arsenicals in Treatment of Hydrocephalus.—Ortega reports the rapid subsidence of hydrocephalus, in a 10 months infant, under treatment with an arsenical, and calomel internally. He did not apply the Wassermann test to the child or its parents, but the notable improvement confirmed the assumption of inherited syphilis. It had developed apparently normally until the sixth month when the head began to grow very large.

Revista Médica del Uruguay, Montevideo

July, 1922, **25**, No. 7

Visiting Nurses. J. A. Bauzá.—p. 521. Idem. R. Berro and C. Pelfort.—p. 528. Idem. L. Morquio.—p. 575.
*Psoriasis and Pregnancy. J. Brito Foresti.—p. 531.
*Neurosyphilis. H. del Campo.—p. 537.
Cerebrospinal Meningitis in Three Months Babe: Recovery. N. L. Bloise.—p. 568.
*Syphilis Revealed by Skin Infections. J. May.—p. 572.

Psoriasis and Pregnancy.—Foresti reports three cases in which old psoriasis disappeared completely during a pregnancy but returned afterward the same as before. One of the women had this experience repeated in her nine pregnancies. The psoriasis first developed at the age of 18 and was general, and no treatment had ever succeeded in curing it completely. In the second case the psoriasis had preceded puberty and it persisted after the menopause, but it disappeared completely during the six pregnancies. In Montevideo, psoriasis forms about 3 per cent. of all the skin affections encountered, but in none of the other cases observed was there any modification during a pregnancy.

Neurosyphilis.—Del Campo declares that the timid treatment of the past was responsible for allowing neurosyphilis to develop. If we attack syphilis vigorously from the first, and watch for the earliest manifestations from the nervous system and, when such appear, treat them with even greater energy with both the arsenical and mercury, we will ward off tabes, general paresis and hemiplegia.

Syphilis Revealed by Skin Infection.—May has had several cases in which trauma or an intercurrent dermatitis revealed an unsuspected syphilis. In two cases described here the erysipelas or impetigo process was on the nostril or lip of the women.

Deutsche medizinische Wochenschrift, Berlin

July 7, 1922, **48**, No. 27

*Serologic Demonstration of Syphilis by Flocculation. Sachs.—p. 891.
*Plethysmographic Tests in Heart Disease. E. Weber.—p. 894.
Acquired and Hereditary Immunity to Tuberculosis. Thomas.—p. 895.
*Iodin and Arsenic in Treatment of Goiter. F. Mendel.—p. 896.
*Parenchymatous Injections in Goiter. G. Krebs.—p. 898.
Management of Perforated Gastric or Duodenal Ulcer. W. Röpke.—p. 899.
*Artificial Pneumothorax with Kidney Disease. C. Rowe.—p. 900.
Colloidal Gold in Tuberculosis. E. Levy.—p. 900.
*Necropsy in Case of Paroxysmal Tachycardia. P. Hampeln.—p. 901.
Successful Treatment of Case of Gonorrheal Polyarthritis with Meningococcus Serum. C. Froemsdorff.—p. 902.
*Diathermy in Gonorrhea in Women. Kyaw.—p. 902.
Clinical Value of Routine Blood Examination. Hoffmann.—p. 903.
The Time Element in the Practical Determination of Blood Picture. V. Schilling.—p. 904.
Technic of Deep Tamponing. Wieting.—p. 904.
A Rare Case of Ileus. Lübke.—p. 905.
Paralysis of Facial Nerve Following Use of Chromic Acid in the Mastoid. T. von Liebermann.—p. 905.
Fatal Blood Disease in New-Born Following Recovery from Congenital Mechanical Icterus. Kaboth.—p. 905.
Diagnosis and Treatment of Depressive States. Henneberg.—p. 906.
Technic of Catheterization and Bladder Lavage. Casper.—p. 908.

Precipitation Tests for Syphilis.—Sachs describes the different modifications that have been proposed for the Sachs-Georgi test by various serologists, and emphasizes the confirmation they bring as to the dependability of the principle involved.

Plethysmographic Warning of Incipient Heart Disease.—Weber has serial plethysmographic records from thousands of subjects examined during the last sixteen years. He investigated the effect of exercise, of stimuli of various kinds, repose, etc., and found that by this means it is possible to detect incipient insufficiency of the circulatory apparatus before it becomes apparent in any other way. If the fastened down foot, for example, is exercised vigorously for a few minutes, the blood content of other parts of the body increases, as recorded by the plethysmograph. He ascribes this not only to the heart but to a stimulation of centers in the brain. If the blood contains an excess of waste products, the centers become irritated, and instead of their sending out an impulse for the salutary dilation of the vessels in the muscles, they induce the vessels to contract, and the plethysmograph curve falls. This falling curve is a remarkably instructive index as to the extent of fatigue, and the danger of forcing the heart if the exercise is continued under this negative plethysmograph curve. It is also the earliest sign of insufficiency in the circulatory system.

Combined Use of Iodin and Arsenic in the Treatment of Exophthalmic Goiter.—Mendel surveys the results of the combined intravenous use of iodin and arsenic in the treatment of more than 100 cases of exophthalmic goiter in ten years. The treatment has always had a prompt effect, having never failed absolutely, while in a large percentage of cases considerable improvement was brought about and in a number of severe cases a permanent cure was accomplished. The technic of this intravenous chemotherapy is exceedingly simple. Every other day, or, after the patient begins to improve, once or twice a week, injections of this solution are given: atoxyl 1 gm., sodium iodid 8 gm., water to make 40 c.c. He gives in detail the case report of a 52 year old school principal. The patient was much emaciated, weighing only 120 pounds. The expression and appearance of the face were unusually bad, the skin being livid, reddened and moist. There was a moderate but distinct exophthalmos and a medium-sized soft goiter. A marked pulsation of the carotid arteries was noted. The hands were hot and moist and affected by a rapid tremor. The pulse was 140. The patient was in a despairing frame of mind and complained of general weakness, headache, dizziness, restlessness, insomnia, diarrhea and profuse sweating. Injections of the iodin-arsenic solution were begun, for the first two weeks 2 c.c. being given every other day, then the same dose twice a week over a period of four weeks. After the first few injections the patient's spirits improved, the heart action was better and hidrosis became less marked. As the treatment was continued, all the symptoms of exophthalmic goiter abated rapidly; also the diarrhea, without dietary regime. In six weeks the patient gained 20 pounds. The tremor had disappeared entirely. The patient felt so much better he went away for a vacation trip. During his absence, in spite of good and adequate food, he made no further gain in weight. After his return he did not feel so well as he did when he left. Treatment was recommenced with two injections a week, with the result that all the symptoms of exophthalmic goiter were eliminated. After the lapse of five years the patient feels perfectly well and weighs about 164 pounds, a gain of 24 pounds.

Parenchymatous Injections in Goiter.—Krebs reports his experience, during the past twenty-nine years, with parenchymatous injections of tincture of iodin in nearly 1,000 cases of goiter. A cure was effected in 80 per cent. of the cases. He has excluded from such treatment all cases with much

dyspnea, as he feared that the reactive swelling of the thyroid gland, which commonly occurs during the days immediately following the injection, might increase the dyspnea. It must be admitted that there are dangers associated with the method, although these are sometimes much exaggerated. They are slight as compared with strumectomy, which results in about 3 per cent. of mortality, although Kocher reported at the surgical congress in 1911 that he had performed 461 operations without a single fatality. He recalls that operative intervention has other dangers. There is thyroprival cachexia, which Reichel observed even though he had left thyroid remnants the size of an egg. Parathyroprival tetany is another untoward sequel. Paralysis of the recurrent nerve, sometimes bilateral, with its dire results, is also to be feared. One writer reports a 20 per cent. frequency of postoperative disturbances of the labium vocale. Krebs holds that in comparison with the dangers just cited, the risks of parenchymatous injections are not great, though much caution should be observed.

Contraindication of Artificial Pneumothorax in Pulmonary Tuberculosis with Kidney Disease.—Rowe relates a case in which sudden exacerbation of nephritis was caused by the induction of a pneumothorax. He concludes that caution should be exercised in the matter of inducing pneumothorax in the tuberculous with chronic glomerulonephritis, unless by preceding tuberculin treatment the hypersensitiveness can be eliminated.

Necropsy Findings with Paroxysmal Tachycardia.—Hampeln found a band in the pericardium which pulled on the impulse node region. Summation of irritation from this must have entailed the paroxysms—an actual epilepsy of the heart.

Diathermy in Treatment of Gonorrhea in the Female.—Kyaw declares that this treatment can be counted on to cure in all cases. It is equally effectual whether the electrode is applied in the rectum or the vagina. He graduates the heat with thermometers on the pelvis, in the vagina and in the rectum, and applies it for three hours at least, and preferably for nine hours a day with an intermission of three hours. He repeats the application until no gonococci can be found in swabs on three successive days. He has thus cured 40 women in a few days. The gonococci are killed in six hours by a temperature of 40 C.; in three hours and fifteen minutes at 42, and in one hour at 44. His patients bore up to 44.5 C. for hours without harm.

Medizinische Klinik, Berlin

July 30 1922, **18.** No. 31

*Immunity to Cancer. C. Lewin.—p. 983.
Bárány's Methods of Examination. R. Fischer.—p. 987.
Principles for Treatment of Peptic Ulcer. W. Körte.—p. 989.
*Muscular Tension in Mental Disease. P. Schilder.—p. 990.
Retropharyngeal Angina in Young Children. Stickdorn.—p. 991.
Combined Friedmann and Pneumothorax Treatment. V. Bock.—p. 992.
*Palpitations with Mitral Stenosis. K. Fahrenkamp.—p. 994.
Neosilver-Arsphenamin in Syphilis. Liebner and Rado.—p. 996.
The d'Herelle Phenomenon. W. Seiffert.—p. 997. Cont'd.
Fright Neurosis; Traumatic Neurosis. H. Engel.—p. 999.
*Rudiments of Obstetrics. E. Runge.—p. 1001. Cont'd.
Practical Application of Duodenal Sound. L. v. Friedrich.—p. 1003.

Cancer Immunity.—Lewin relates that when he took up anew his work in the Cancer Research Institute after the war, two new elements had entered into the study of cancer during his long absence. These two new elements were the so-called protein therapy, and the fact that white corpuscles are of essential importance in the resistance of the body to malignant disease. Artificially induced leukopenia favors the growth of cancer while leukocytosis checks it. For the last three years he has been experimenting with cancer along both these lines, and reports encouraging results with all, as also with roentgenization and all kinds of means to stimulate the organism to speed up the vital processes. It is a nonspecific action, but it reenforces the natural defences. In one group of twenty-one mice inoculated with cancer it developed rapidly in all but four, but there was no growth at all in any of another group of twenty mice that had been given parenteral injection of from 0.5 to 1 c.c. of a 2 per cent. solution of nucleic acid, before they were inoculated with the cancer. This protection against the cancer was most pronounced when applied beforehand, but a certain degree of protection was evident even when the acid was not injected until afterward. Caspary has reported success along these same lines by stimulating with a weak dose of roentgen rays. All the experiences related confirm that in the fight against cancer we must stimulate the organism as a whole in addition to our local measures. His experiments confirm that the leukocytes and, above all, the lymphocytes are the active agents in this artificially induced immunity against malignant disease, whether brought about by protein therapy, autoserotherapy, autolysates of tumors, embryonal cells, blood or normal tissue, tumor tissue or chemicals of different kinds. In addition to this nonspecific reenforcing of the natural defences we can count also on a tendency to direct active immunization by antibodies generated by the tumor itself. This is too weak to be of much use alone, but it may usefully supplement our other measures. The organism must be still capable of vital reactions.

Psychophysiology of Motor Disturbances with Mental Disease.—A case is described in which a young woman with certain symptoms of schizophrenia seemed unable to control the extrapyramidal motor apparatus.

Palpitations with Mitral Stenosis.—Fahrenkamp found the clinical picture practically identical in fifteen patients with mitral stenosis. All presented symptoms suggesting nervous excitability of the heart, but the aggravation of the symptoms after physical exercise corroborated the physical findings of organic valvular disease. The absolutely identical clinical picture in all seems to indicate that the psychic features of this form of valvular disease are secondary to the latter. In repose the symptoms are like those with purely nervous disordered action of the heart, but with emotional stress or muscular exercise the aggravation is pronounced and the patients are distressed. Especially after retiring or waking in the night, the depression is extreme and there may be tachycardia. This psychic reaction to emotions and to darkness was pronounced in each member of the group. Mild faradization of the heart region, which is so effectual with vasomotor irritable heart, failed completely in these cases. A course of camphor injections for eight or ten days always relieved; the patients felt better and stronger and the heart grew quieter. Carbonated baths invariably gravely aggravated the disturbances. One patient with frequently returning tachycardia was relieved somewhat by quinidin although the heart beat was not slowed. When the heart rate was over 120, prolonged digitalis treatment brought it down to 80, but in other conditions no benefit was derived from digitalis. Bromids to reduce the excitability were given in some cases. The cause for the subjective disturbances is evidently in the heart itself. The cause responsible for the mitral stenosis seems to have injured the terminal apparatus of the heart nerves. The possibly slight clinical findings are liable to mislead to the assumption of a purely functional disturbance, and the mitral stenosis may escape detection unless this psychic picture is interpreted aright.

Rudiments of Obstetrics.—This long continued serial article is like a quiz, Runge asking a question and then answering with full details. He has nearly reached his two hundredth question.

Monatsschrift für Geb. und Gynäkologie, Berlin

June, 1922, **58.** No. 1-2

Fatal Menorrhea in Diabetic Girl. H. Kufinger.—p. 1.
*Blood Pressure and Eclampsia. H. Schlossmann.—p. 4.
*Necrosis of the Pancreas in Pregnancy. N. Ellebrock.—p. 13.
Precipitation Serodiagnosis in the Pregnant. Bathe.—p. 21.
Treatment of Afebrile Abortion. K. Reiter.—p. 28.
Treatment of Febrile Abortion. H. Schnitzer.—p. 34.
Treatment of Peritonitis After Abortion. W. Simon.—p. 40.
Closing Vagina in Treatment of Genital Prolapse. W. Krull.—p. 49.
Origin of Krukenberg Tumors. A. Greil.—p. 59.
Ratio of Sexes in the New Born. E. Graff.—p. 65.
Limitation of Midwives. E. Martin.—p. 78.

Blood Pressure and Eclampsia.—Schlossmann found a blood pressure above 120 in all of the 200 pregnant women examined who showed signs of edema or albuminuria or other complications. The data related sustain his assumption that the rise in the blood pressure is the earliest and the most reliable sign of injury from the toxic action of some product

generated in the course of the pregnancy. A blood pressure over 125 is a far more reliable index of the intoxication going on than the amount of edema or the urine findings. The blood pressure showed promptly the favorable influence of restriction of salt, fat and proteins in the diet in cases suggesting eclampsia. The edema may or may not subside; this is immaterial. The important thing is to reduce the toxic action on the capillaries. Eclampsia is always preceded by a rise in blood pressure.

Pancreas Necrosis in Relation to Pregnancy.—Ellebrock reports a case of acute fatal necrosis of the pancreas developing soon after delivery. He suggests that this may have been overlooked in some cases of supposed puerperal fever and postoperative complications. An early operation is the only recourse, but the differential diagnosis is difficult.

Münchener medizinische Wochenschrift, Munich

June 23, 1922, **69**, No. 25

Chemical and Pharmacologic Synergy. H. Fühner.—p. 915.
*Roentgen Irradiation of Cancer of the Uterus. E. Opitz.—p. 917.
*The So-Called Arndt-Schulz Biologic Law. K. Süpfle.—p. 920.
The Pathogenesis of Metasyphilis. W. Gennerich.—p. 922.
*Serodiagnosis of Syphilis. P. Esch and J. Wieloch.—p. 926.
*Concentration of Cerebrospinal Fluid. G. Wüllenweber.—p. 927.
*Effect of Saponin on Flocculation Reactions. P. Niederhoff.—p. 929.
Treatment of Old Congenital Luxation of Hip Joint. A. Schanz.—p. 930.
Accidents in Paravertebral Cervical Anesthesia. O. Winterstein.—p. 931.
Experiences with the Roentgen Spectrometer. K. Staunig.—p. 933.
Bladder Injury from Pessary Broken in Vagina. W. Rübsamen.—p. 934.
Asthma and Tuberculin. W. Pfalz.—p. 934.
Notions of Inflammation and Inflammation Theories. L. Aschoff.—p. 935.
Pathology and Therapy of Chlorosis and Secondary Anemias. P. Morawitz.—p. 937.

Roentgen-Ray Treatment of Uterine Cancer.—Opitz discusses this subject from the biologic point of view, and describes the experiences at the Freiburg gynecologic clinic.

The Arndt-Schulz Biologic Law.—Süpfle reports bacteriologic research on this so-called law, which fails to sustain its validity.

Serodiagnosis of Syphilis.—Esch and Wieloch report research on women during pregnancy and during and directly after parturition, and on the new-born. One of the practical conclusions is that the statistics that have been published need revision so far as these groups of subjects are concerned.

Concentration of Cerebrospinal Fluid.—Wüllenweber comments approvingly on the Löwe interferometer method for determining the concentration of the cerebrospinal fluid in diagnosis of disease of the central nervous system.

Effect of Saponin on Serologic Tests.—Niederhoff reports that addition of saponin inhibits positive flocculation in the Sachs-Georgi test, and disturbs it in the Meinicke test, but not in the Uhlenhuth precipitation test.

Wiener klinische Wochenschrift, Vienna

June 29, 1922, **35**, No. 26

Gunshot Injuries from Medicolegal Standpoint. G. Strassmann.—p. 575.
*So-Called Acute Abdomen. J. Schnitzler.—p. 577. Conc'n.
Smallpox Vaccine Immunity. G. Morawetz.—p. 580.
*Thiosulphate Test of Kidney Functioning. W. Nyiri.—p. 582.
*A Case of Adnexal Hernia. A. Birmann.—p. 583.
Embryology of Heart Malformations. A. Spitzer.—p. 584. Conc'n.

So-Called Acute Abdomen.—Reviewed on page 1087.

Thiosulphate Test of Kidney Functioning.—Nyiri injects intravenously 10 c.c. of a 10 per cent. solution of sodium thiosulphate, and examines the urine voided once each hour thereafter for three hours. About 20 c.c. from each portion of urine is mixed with 0.5 gm. of animal charcoal, stirred well for two or three minutes, and then filtered. Each filtrate is then mixed with 10 c.c. of starch solution and then one tenth normal solution of iodin is added and the blue tint is titrated. The urine voided just before the test is treated the same way. From 60 to 70 per cent. of the sodium thiosulphate is oxidized in the body to sodium sulphate, and the remaining 30 or 40 per cent. is eliminated unmodified in the urine, if the kidneys are sound. If the kidneys are diseased, they do not eliminate the drug, only from 1 to 23 per cent. being refound in the urine. The elimination occurs almost entirely during the first hour. The charcoal gets rid of the substances in the urine which might disturb the test, while it does not affect the thiosulphate. As 1 c.c. of the one tenth normal iodin solution corresponds to 15.8 mg. of the sodium thiosulphate, the number of cubic centimeters of the iodin solution that were used is multiplied with 15.8 to obtain the number of milligrams of thiosulphate in 10 c.c. of urine (after deducting the 1 c.c. or other figure representing the amount required by the urine voided before the test). He gives a few from the sixty cases in which he has repeatedly applied this test, charting the invariable 25.3 to nearly 40 per cent. in patients with sound kidneys, in contrast to the 0.20 to 0.85 at most in the patients with kidney disease.

Gravid Tube in Hernia.—Birmann states that he has found four cases on record of incarceration of a gravid fallopian tube, and he adds another case to the list. In Beck's case the pregnancy corresponded to two and a half months.

Zeitschrift für klinische Medizin, Berlin

June 30, 1922, **94**, No. 4-6

*Streptothrix Meningitis. R. Neumann and L. Rabinowitsch-Kempner.—p. 215.
*Hemoglobin. E. Leschke and K. Neufeld.—p. 224.
*Action of Parenteral Sulphur. R. Meyer-Bisch.—p. 237.
*Metabolism in Obesity. W. Arnoldi.—p. 268.
*Insufficiency of the Sweat Glands. W. Siebert.—p. 317.
Oxyhemoglobin and Hematoporphyrin in Human Bile. W. Robitschek.—p. 331.
*Functional Tests of the Kidneys. S. Litzner.—p. 338.
*Splenectomy in Treatment of Hemorrhagic Diathesis. G. Cori.—p. 356.
*Etiology of Infectious Diseases. L. Patsch.—p. 370.
*Tests for Occult Bleeding. J. Gattner and E. Schlesinger.—p. 426.
*Bence-Jones Proteinuria. A. Perlmann.—p. 436.
The Thrombocyte Question. W. Steinbrinck.—p. 447.
*Group Agglutination in Blood Transfusion. J. Vorschütz.—p. 459.

Streptothrix Meningitis.—The boy of 3 succumbed speedily to meningitis following otitis media. This is the fourth case of the kind to be published. In this and in one of the other cases there was tuberculosis in the family.

Research on the Hemoglobin.—Leschke and Neufeld report that the oxygen and iron content was found constantly the same in the hemoglobin from healthy persons and cases of pernicious and secondary anemia, hemolytic jaundice and polycythemia.

Action of Sulphur.—Meyer-Bisch gave the sulphur parenterally and tabulates the findings showing its important action on the metabolism and on the composition of the blood, and comparing this action with that of protein therapy, etc. All of these substances induce a nonspecific reaction in the sick and the well. This "protoplasm activation" modifies the water metabolism, and, after sulphur and milk, there is constantly also urobilinuria with glycuronuria. There seems to be further a causal connection between the sulphur and certain constitutional diseases. The research described indicates the importance of further study of the sulphur content of the body fluids.

The Metabolism in Obesity.—Arnoldi's monograph is devoted principally to study of the metabolic processes which entail obesity. He emphasizes the differences in the metabolism according as the vagus or the sympathetic system abnormally predominates. Three pages of bibliographic titles set solid are appended, the references following the style adopted in this country, volume, page and year—an innovation in German bibliography.

Research on Persons Unable to Perspire.—The effect of pilocarpin, atropin and epinephrin was studied on subjects with insufficiency of the sweat glands, with parallel tests in normal subjects.

Functional Tests of the Kidneys in Relation to Prognosis.—Litzner refers to test elimination of substances foreign to the organism, such as potassium iodid and lactose. He has been investigating the present condition of 70 patients tested in this way ten years ago. A similar study of tests with organic substances, natural to the body, was published in the preceding volume of the *Zeitschrift*. The verdict is in favor of tests with substances foreign to the organism as the more sensitive and reliable indicators of slight functional derangement under certain conditions, the tests with lactose in particular. When the findings were unfavorable in regard

to the duration of elimination of lactose, the amount eliminated in the first four hours, and the curve of concentration, the outcome was always unfavorable. This research has established further that these functional tests can be relied on for the prognosis, notwithstanding that they are supposed to reveal the condition of the kidneys merely for the moment. Even in the cases of acute glomerular nephritis, the outcome corresponded approximately to the deductions from the functional tests. In cases with much interference from extrarenal factors, the tests with alien substances gave more reliable findings. On the other hand, when merely the kidney itself was abnormal, tests with substances natural to the body revealed this often earlier than the tests with alien substances.

Splenectomy for the Hemorrhagic Diathesis.—Cori refers to that manifestation of the hemorrhagic tendency which is known as thrombopenia. He describes three cases in which he removed the spleen in treatment of this thrombopenia. The blood platelets in the splenic vein blood numbered only 1,200 while in the peripheral venous blood the average was 4,000. This apparently testified to excessive destruction of platelets in the spleen. Other features also apparently testified that the spleen, and the spleen alone, generates some substance which injures the vessel walls, and that this factor in the hemorrhagic tendency was eliminated by splenectomy. In Case 1, the girl of 13 had blue patches almost continuously for four years, on the whole body, with recurring profuse epistaxis. No internal measures gave any relief and a particularly severe hemorrhage followed roentgen treatment. The platelets kept always below 5,000. Splenectomy transformed conditions, the platelets rose to 109,000 in six hours and by the end of the tenth month were still 23,000. There has been no trace of hemorrhage since. The girl began to menstruate seven months after the operation, and menstruation has been normal. In the second case the thrombopenia was pronounced in the boy of 12, but as there were no severe hemorrhages, intervention was restricted to protein therapy, calcium, etc. The parenteral injections of milk were followed by a rise in the platelet count. The third case was a young woman incapacitated by the profuse hemorrhages, epistaxis and menorrhagia. The platelets numbered 4,000 but only 1,200 in the splenic vein. Eight hours after splenectomy they numbered 63,750. A subphrenic abscess developed and proved fatal, the twenty-ninth day after the operation. During the septic fever the platelets ran up to 1,150,000.

Etiology of Infectious Diseases.—Paneth calls attention to the fact that the diphtheric local process is not characteristic for diphtheria. He asserts further that the efficacy of antitoxin in prophylaxis indicates that diphtheria is unable to develop in the absence of the vital products of the diphtheria bacillus. The disease as we know it, however, seems to be a combination of diphtheria and ordinary infectious sore throat or sepsis. Antitoxin has no action on the streptococci, etc., of the latter. The problem is not so simple as we have been assuming hitherto. He quotes the saying that it is a poor tribute to a teacher to remain his pupil always. We do most honor to our teacher by carrying on his work to further heights, and he thinks he has accomplished this here by his demonstration that infectious diseases are seldom pure. They generally represent a combination of biologic units.

Occult Bleeding.—Gattner and Schlesinger describe how to apply the benzidin test for invisible blood as a quantitative indicator of remarkable precision. We can thus supervise the wave of the hemorrhagic tendency and guide treatment accordingly. Each of the set of test tubes, except the first, contains 2 c.c. of distilled water. In the first and in the second is placed 2 c.c. of the suspension of the stool (2 gm. of feces in 8 c.c. of distilled water). From the second tube, 2 c.c. of the contents are transferred to the next tube, and so on through the series. Then 3 c.c. of the reagent is added to each tube. The number of the last tube giving a positive reaction varies as the bleeding rises and falls. The formula for the reagent is 10 c.c. of a 10 per cent. solution of benzidin in glacial acetic acid; 2 c.c. of hydrogen dioxid (perdrydol); 8 c.c. of decinormal sulphuric acid, and 10 c.c. of distilled water. They found pulverized desiccated blood from the slaughter house useful for comparative research.

Bence-Jones Proteinuria.—Minute details of a case in a man of 43 confirm the descriptions of others. Perlmann adds that no case of multiple myelomas is known in which during life the Bence-Jones proteinuria had failed to appear. Its absence, however, does not exclude the assumption of multiple myelomas.

The Blood Groups from Transfusion Standpoint.—Vorschütz presents evidence that the previous taking of a drug, or general anesthesia, or roentgen irradiation may modify the blood enough to change it from one group to another for the time being. This may interfere with transfusion work. He points out, further, that serum from persons with cancer, tuberculosis or inflammatory processes in the subacute and chronic stages lake the blood cells and conglutinate them. He classifies bloods in five separate groups.

Zeitschrift für Tuberkulose, Leipzig

July, 1922, **36**, No. 5

*Phrenicotomy. H. Alexander.—p. 325.
*Tuberculous Rheumatism. B. Valentin.—p. 336.
*Predilection of One Side to Tuberculosis. A. E. Mayer.—p. 338.
Alternating Hot-Cold Air in Treatment of Tuberculosis. H. Mueller. —p. 347 Idem. Schelenz.—p. 350.
*Staining of Tubercle Bacilli. F. Geschke.—p. 351.
"Suspension Stability of Erythrocytes in Diagnosis of Tuberculosis." A. V. Frisch.—p. 360. Reply. G. Katz.—p. 361.

Phrenicotomy in Treatment of Pulmonary Tuberculosis.—Alexander severed the phrenic nerve on one side in 7 cases and in 7 others severed and tore out part of it. In 6 cases striking benefit followed; the bacilli disappeared from the sputum in 4 of them. In 3 cases there was distinct but slight benefit; in 4 cases no effect was apparent, and in 1 instance there was transient aggravation. In 12 of the total 14 the other lung was already involved, and all were severe cases, in which artificial pneumothorax was impracticable. A great advantage of the phrenicotomy is that it does not interfere with other measures. In one of the cases described, pneumothorax could be induced later. The diaphragm stood 4.25 cm. higher afterward, and 2.15 cm. higher after mere phrenicotomy. The operation on the phrenic nerve is simple and easy; it helps the lung in the natural curative shriveling process, and might advantageously precede thoracoplastics. Exclusion of the phrenic nerve is useful also in the estimation of recent changes in the other lung.

Tuberculous Rheumatism.—In the case described, both wrists and ankles and other joints presented typical Poncet rheumatism, secondary to a small tuberculous focus in the lung. Cheesy masses were found in one bursa that had to be resected. No treatment proved effectual to ward off ankylosis in the girl of 12.

Unilateral Tuberculosis.—Mayer relates that of the 2,500 patients treated at the Turban sanatorium, other organs besides the lung were affected in 630 cases. The lesions were all on the same side in a little over 50 per cent.

Staining of Tubercle Bacilli.—Geschke gives the findings in parallel tests with five different staining methods in the sputum from 56 cases and from the pus in 40. All this evidence testifies, he asserts, that the Spengler method, or the modification of it by Jötten-Haarmann, is far more reliable than any other. We are liable to be misled by the unreliable Ziehl-Neelsen findings. The number of tubercle bacilli shown by the Ziehl-Neelsen in one visual field averaged only 4.67, in marked contrast to the 25.18 found with the Spengler technic in the same sputum. The Konrich method yielded only 9.26. The Ziehl-Neelsen twice was entirely negative when the other methods showed 2.8 and 0.65. In one case the Ziehl showed 19.7; the Spengler, 370.3. With the Spengler method, the ordinary carboliuchsin stain is followed by picric acid-alcohol for two or three seconds after pouring off the fuchsin. Then 3 or 4 drops of a 15 per cent. solution of nitric acid for five seconds. This is then poured off, and the picric acid-alcohol is applied again until the sputum looks yellowish. Then wash in water; dry, etc. The picric acid solution is made with 2 gm. of picric acid in 40 c.c. of distilled water, allowed to stand for twenty-four hours; then it is filtered, and an equal volume of 96 per cent alcohol is added.

Zeitschrift für urologische Chirurgie, Berlin

July 12, 1922, 10. H. Kümmell Festschrift

*Hydronephrosis. F. Oehlecker.—p. 1.
*Roentgenography of Destroyed Kidney and Ureter. F. Oehlecker.—p. 47.
*Nephrectomy in Pyelitis. Idem.—p. 52.
*Hydronephrosis in Half of Horse-Shoe Kidney. Idem.—p. 66.
Abscess in Bed of Displaced Kidney. Idem.—p. 74.
Own Urine and Own Serum Tests for Tuberculosis. E. Roedelius.—p. 77.
*Radiography of Kidney Calculi. H. Kümmell, Jr.—p. 92.
*Absorbable Tampons. H. Kümmell, Jr.—p. 98.
Congenital Diverticulum of Bladder; Five Cases. W. Anschütz.—p. 103.
Local Anesthesia in Urologic Surgery. M. Cappis.—p. 113.
*Scrotal Hypospadias. H. Flörcken.—p. 119.
Hydronephrosis from Vascular Anomaly. G. Ekehorn.—p. 122.
Calculus in Lower Ureter. M. Zondek.—p. 125.
*Intrarenal Aneurysms. P. Janssen.—p. 130.
Treatment of Nonmalignant Bladder Tumors. P. Wulff.—p. 137.
Prostatectomy at One Sitting. P. Wulff.—p. 140.
Cystic Degeneration of One Kidney. P. Wulff.—p. 142.
*Syphilitic Disease of Bladder. S. Faragó.—p. 144.
*Latent Stretching of Kidney Pelvis. O. Orth.—p. 150.
*After-Treatment of Prostatectomy. N. Kleiber.—p. 156.
Primary Suture of Bladder After Prostatectomy. F. Bonhoff.—p. 161.
Pathology of Neck of Bladder. O. Schwarz.—p. 167.
*Urine and Kidney Findings with Renal Tuberculosis. C. Steinthal.—p. 184.
Operative Treatment of Incontinence of Bladder. P. Frangenheim.—p. 190.
Calculus in Prostatic Urethra. E. Wehner.—p. 204.
Hypernephroma with Single Metastasis. F. Colmers.—p. 214.
The Prostatectomy Question. Guleke.—p. 219.
Necessity for Nephrectomy in Renal Tuberculosis. H. Nieden.—p. 230.
Exact Chromocystoscopy. Pflaumer.—p. 245.
Roentgen Findings with Surgical Kidney Disease. E. Joseph.—p. 251.
Ureter Calculi from Clinical Standpoint. H. v. Engelbrecht.—p. 265.
*Kidney Cancers from Clinical Standpoint. K. Scheele.—p. 283.
*Mishaps with Pyelography. H. Brütt.—p. 295.
War Wounds of the Bladder. J. P. Haberern.—p. 315.
Hydronephrosis of Kidney Pelvis. W. v. Gaza.—p. 318.
Vascular Complications with Hypernephroma. E. Rehn.—p. 326.
*Profuse Hemorrhage from the Kidney. H. Rubritius.—p. 333.
Pyelography from Anatomic Standpoint. M. Grauhan.—p. 343.
*After-Treatment with Suprapubic Prostatectomy. R. Roedelius.—p. 353.
*Hemorrhage After Nephrotomy. E. Rehn and P. Röttger.—p. 359.
Cystic Degeneration of the Kidney. E. Wossidlo.—p. 385.
Pseudo Tumors of Ureter Papilla. F. Necker and R. Paschkis.—p. 394.
*Local Treatment of Kidney Pelvis. K. Schramm.—p. 402.
Treatment of the Over-Distended Bladder. M. Waldschmidt.—p. 416.
*Pyelography. Lehmann.—p. 420.
*Diverticula of the Bladder. O. Kneise and R. Schulze.—p. 461.
*Papillary Tumors of Pelvis and Ureter. H. Brütt.—p. 500.
*Pneumoradiography of the Bladder. P. Rosenstein.—p. 511.
*Primary Carcinoma of Ureter. F. Suter.—p. 522.
Diagnosis of Small Concretions in Pelvis and Ureter. V. Blum.—p. 528.
List of Works Published from Kümmell's Service Since 1895. H. Brütt.—p. 537.

Hydronephrosis.—Oehlecker's study of the various forms of hydronephrosis is profusely illustrated, showing the various means devised for treatment. He insists that even large hydronephrotic kidneys are capable of recuperation to an astonishing extent. Plastic operations to correct the anomaly should be applied more extensively. It is important to keep patients under supervision after such operations as long as possible, and apply the functional tests. Pyelography in particular would be highly instructive, and with sodium bromid no mishaps need be feared.

Spontaneously Destroyed Kidney.—In the characteristic roentgenogram of a *kittniere*, the ureter cast a broad shadow also.

Nephrectomy with Pyelitis.—Oehlecker describes with illustrations his method of operating through an incision along the edge of the rectus, with two curving incisions in the peritoneum, overlapping and suturing the outer edges together. By this means the peritoneum is closed, and the operation on the kidney can then proceed entirely extraperitoneal. He drains through the lumbar region. This method was particularly advantageous in a case described in which he successfully operated for hydronephrosis in one half of a horse-shoe kidney.

Radiography of Kidney Calculi.—Kümmel placed transparent kidney calculi in rubber cots and then filled the cots with contrast suspensions for roentgenoscopy. His numerous experiments demonstrated that silver nitrate is the most effectual for this purpose. He suggests that injection into the kidney pelvis of a 2 per cent. solution of silver nitrate is justified in dubious cases, as this by impregnating the calculus may reveal previously invisible concretions. Inflation with air is also liable to enhance the visibility.

Absorbable Tampons.—Kümmell uses a substance resembling cotton or felt which is made from animal membranes in a catgut factory. They are reduced to fine fibers and threads, and these are packed to form pads and sheets, and these serve as tampons over which the skin can be sutured. The thrombokinase in them aids in the effect of the mechanical tampon, and the fibers swell up and cling closer the longer they lie in the tissues. This tampon comes to look finally like a thrombus, and is gradually resorbed in about six weeks. Its tissues seem to aid in repair. In urologic operations, it effectually combated capillary hemorrhage, and it always healed smoothly in place.

Scrotal Hypospadias.—Flörcken advises Rochet's technic when the Helferich method is not practicable. The urine should be diverted through the perineum as the first step.

Intrarenal Aneurysm.—Janssen remarks that in many cases of supposed essential hematuria an intrarenal aneurysm may have been responsible, as in two cases reported. In the first, the man succumbed to the losses of blood, although prompt nephrectomy arrested the hemorrhage. A sharp edged calculus had been removed a week before; the injury of the vessel from this had not been recognized at the time. In the other case, cardiorenal disease and high blood pressure had been the main factors. The symptoms had indicated suppuration around the kidney, but an exploratory operation the day before the rupture of the aneurysm had been negative.

Syphilitic Disease of Bladder.—In both of Faragó's two cases the symptoms resembled those of nervous pollakiuria only, but the cystoscope revealed minute gray nodules scattered over the bladder mucosa, each with a red halo but no ulceration. Nothing was known of infection with syphilis in either case, and there never had been other appreciable manifestations from it. In both cases all the symptoms and the nodules promptly subsided under mercury and arsenicals. Both patients were married women.

Latent Hydronephrosis.—In the five cases reported by Orth, the dilatation of the kidney pelvis escaped detection until it was revealed by the ureter catheter and pyelography. Four were clinically cured by draining the pelvis with a ureter catheter at regular intervals; it was sometimes left in place over night. The pelvis was treated further with silver nitrate. In the fifth case a plastic operation to reduce the size of the pelvis did not have much effect; nephrectomy would have been better.

After Prostatectomy.—Kleiber wards off bleeding from the raw bed of the prostate by drawing a tampon down into this bed with a string held in a Bellocq cannula, introduced from the urethra below, the tip emerging in the suprapubic incision. This does not interfere with the drainage of urine through the incision. The only drawback is the tenesmus induced by the pressure from the tampon; but this can be combated with a sedative suppository. He ascribes epididymitis to infection from the retention catheter, and for this reason postpones its use for a week, using smaller and smaller drains in the meanwhile.

Renal Tuberculosis.—Steinthal asserts that our present means for determining tuberculous disease of the kidney are so reliable that we can rely implicitly on positive findings even when an exploratory operation fails to confirm them. In one such case he slit the kidney to make sure, and even this was negative. Necropsy revealed that a tuberculous focus had escaped the nephrotomy, and miliary tuberculosis soon developed. Although the kidney seemed sound in Stöckel's case, he trusted to the positive bacteriologic and other findings, and removed the kidney. Only one minute focus was found. In Braatz' case, he sutured the apparently sound kidney after nephrotomy, and nephrectomy four years later revealed both old and recent foci.

Kidney Cancers.—Scheele remarks that the irregular and apparently causeless appearance and subsidence of hematuria are suggestive of malignant disease, as also when it follows palpation of the kidney. Symptomatic varicocele was never encountered in his cases, but in one case there had been recurring fever for five years, with intervals of a few months at first, the fever finally becoming continuous, with evening rises. Tuberculosis and later slow endocarditis

had been the diagnosis at first. The tumor was inoperable when discovered. Fever may thus be the first and only symptom for a time. In one case the knobby renal tumor was mistaken for the spleen. The weight of the tumor may make the kidney sag. The lungs and bones are the common site of the metastases, but he had a patient with metastasis in fingers and brow after removal of the primary tumor. Metastasis is often single, which fact may encourage operative relief.

Mishaps with Pyelography.—In the three cases described by Brütt collargol had been used, and some obstruction to the outflow had induced retention and distention of the pelvis. In one case at a later operation on the kidney the collargol infarct could be studied, and the infiltration of the kidney substance with the silver. He now uses sodium bromid exclusively in pyelography, in a 20 or 30 per cent. solution. He had one disagreeable experience with a 10 per cent. solution of potassium iodid, and likewise with a 13.5 per cent. solution of sodium iodid. In the latter case there were not only severe general disturbances in the young woman, but also transient local damage of the kidneys. The pyelography had been applied on both sides in this case.

Profuse Hemorrhages from the Kidney.—The kidney was finally removed to put an end to the recurring hemorrhages without apparent cause. An almost microscopic hypernephroma close to a sclerotic vessel explained the hemorrhage.

Treatment After Prostatectomy.—Roedelius applies drip irrigation with hot water or saline before and after suprapubic prostatectomy. This does away with the necessity for tamponing and wards off infection of the bladder. Sometimes the suture threads for closing the bladder and abdominal wall were passed during the operation, but they were not all tied until after two or three days of this thorough flushing of the bladder and urethra. The exact technic is shown in three illustrations.

Hemorrhage After Nephrotomy.—Rehn and Röttger refer to the hemorrhage which follows the nephrotomy in from two to twenty days or later. They explain it as the result of the unphysiological mechanical conditions in the kidney. The organ had been drawn out and its anchoring and circulation disturbed for the nephrotomy. When it is merely pushed back into its normal place, these disturbances persist. By carefully replacing and fastening the kidney, restoring the physiologic mechanical conditions and preventing the loosened organ from sagging or twisting, this after-hemorrhage need not be feared, if free outflow of urine is provided for. Obstruction of the ureter from kinking or clots is liable to induce such pressure as to bring on hemorrhage from the healing nephrotomy tissues. These premises were sustained by experiments on animals and clinical experiences in ten cases of nephrotomy, in the last two years, described in detail. They fasten the inferior pole of the kidney to the twelfth rib and by this means, they say, render nephrotomy an entirely harmless procedure.

Rinsing Out the Kidney Pelvis.—Schramm's experiments on pigs' kidneys confirmed that the kidney tissue is liable to be injured by any pressure. A pressure of only 30 cm. of water is enough to force a fluid up close to the capsule. In filling the kidney pelvis with any fluid, it must never be forcibly injected. He utilizes gravity by raising the pelvis a little, and leaves the fluid in the pelvis for half an hour. Days of restriction of fluids allow more efficient action of the antiseptics taken internally, and take advantage of the disinfecting action of concentrated urine, while occasional days of drinking up to 2 or 3 liters flush out the urinary system. In one case the ureter catheter twisted into a knot.

Pyelography.—Lehmann discusses the possible dangers of pyelography and means to avoid them. He warns to use a catheter not larger than 5 or 6 Charrière and approves of raising the pelvis a little. Some of his experimental researches and clinical experiences are described, with twenty-six illustrations. He insists that pyelography is no more dangerous than catheterization of the ureter alone.

Congenital Diverticulum of the Bladder.—A total of fifty-two cases are known treated by a radical operation, with recovery in all but four. The diverticulum in the majority of cases is not congenital as supposed, but acquired, from some hindrance to the outflow of urine. Some muscular fold or depression starts the process.

Villous Tumors in Kidney Pelvis or Ureter.—Brütt adds two more cases to the three he has previously published. A malignant tendency is frequently evident, an apparently harmless polyp proving to be cancer later or entailing extensive papillomatosis of the urinary apparatus.

Pneumoradiography of the Bladder.—Rosenstein expatiates on the instructive findings with a combination of pneumoradiography and filling the bladder with a contrast suspension.

Carcinoma of the Ureter.—Suter describes a case of primary cancer of the ureter in a man of 65 and a woman of 64. The woman has been apparently cured during the year to date since the ureter was resected. The cancer was inoperable in the man. This brings to twenty-three the number on record.

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Repeated Tubal Pregnancy on Same Side. W. Sigwart.—p. 690.
*Constitutional Element in Albuminuria of New-Born. P. Lindig.—p. 694.
A Bidiscoid Placenta. W. Lahm.—p. 696.
Dual Malformation of Female Genitals with Persistent Rectovesical Ligament and Torsion of Ovarian Tumor. H. Küstner.—p. 700.
A Superficial Ovarian Papilloma. H. Heberer.—p. 702.
Torsion of Tube, with Hematoma; Its Etiology. A. Hansen.—p. 707.
A Case of Uterine Myoma with Extreme Ascites. O. Dunkhase.—p. 709.

The Birth Act and the Constitutional Element in the Genesis of Albuminuria in the New-Born.—Lindig recalls that the kidneys of the new-born have been shown, during the first few days after birth, to present almost regularly a certain degree of permeability for the albumins of the blood plasma. The general opinion has been that the principal cause for the phenomenon lay in the effect of the mechanical strain of the birth act on the fetus. Lindig's observation leads him to ascribe considerable importance to the constitutional factor. It is hard to explain otherwise why infants who are quickly and easily born sometimes present an intensive and long enduring albuminuria.

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The Turtle Tubercle Bacilli (Friedmann) from Clinical Point of View. F. K. Cieszynski.—p. 450.
*Organization of Hospitals and the Ways to Fight Cancer. B. Wejnert.—p. 459.

Extrapyramidal Innervation.—Orzechowski gives minute differences, which are very easy to distinguish, in examination of the patient, between pyramidal paralysis and extrapyramidal paralysis, or paralysis which results from pathology of other than the pyramidal tract. Differential diagnosis tables are given for these two types of paralysis, and also anatomical charts.

Organization of Hospitals and the Ways to Fight Cancer.—B. Wejnert gives statistical tables showing the steady increase of mortality from cancer in different parts of the world, while no extra means are prepared in hospitals to take care of these patients. According to the statistical data of Reichman, based on statistics from England, Germany, Holland and Spain, there were on a given day 104,550 cases of cancer in the whole world, and 300,000 die from cancer each year in Europe alone. Out of forty persons over the age of 40, ten have cancerous pathology in their system.